CHAIN OF ROCKS CANAL

LOWER MISSISSIPPI RIVER BASIN
MADISON COUNTY, ILLINOIS

SPECIFICATIONS FOR

RIVERS EDGE
(FORMERLY KNOWN AS THE CHARLES MELVIN PRICE SUPPORT CENTER)

RELIEF WELLS - PHASE I

SOLICITATION NO. DACW43-02-R-0713

THIS IS A NEGOTIATED CONTRACT
SECTION 8(A) SMALL BUSINESS ACT

US Army Corps
of Engineers
St. Louis District

Gateway to Excellence **August 2002**

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TOC.16

BIDDING REQUIREMENTS, CONTRACT FORMS AND CONTRACT CONDITIONS

DIVISION 1 - GENERAL REQUIREMENTS

DIVISION 2 - SITE WORK

DIVISION 3 - CONCRETE

DIVISION 4 THRU 16
(NOT USED)

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BIDDING SCHEDULE

Item No.	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
0001.	Mobilization and Demobilization	1	LS		$_____
0002.	Stripping	1	LS		$_____
0003.	Care of Water	1	LS		$_____
0004.	Well Screen	345	LF	$_____	$_____
0005.	Riser Pipe	139	LF	$_____	$_____
0006.	Well Drilling	600	LF	$_____	$_____
0007.	Well Installation	600	LF	$_____	$_____
0008.	Well Abandonment	80	LF	$_____	$_____
0009.	Well Development	26	HR	$_____	$_____
0010.	Pumping Tests	18	HR	$_____	$_____
0011.	Relief Well Collector System	1	LS		$_____
0012.	ManHole Repairs	1	LS	$_____	$_____
0013.	Silt Filter Fencing	4,800	LF	$_____	$_____
0014.	Bonding	1	LS		$_____
0015.	Removals	1	LS		$_____
				TOTAL	$_____

ABBREVIATIONS
LS Lump Sum
EA Each
HR Hour
LF Linear Feet

(See BIDDING SCHEDULE NOTES)

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SECTION 00800 - SPECIAL CLAUSES

1. SURVEYS. The work indicated on Drawing No. M-LM-21/G-3, is determined from the latest available survey data. Surveys will be made before and/or during construction. If these surveys indicate any substantial changes, which, in the opinion of the Contracting officer, require a revision in any design feature, drawings and supplementary specifications will be issued.

2. PAY REQUESTS. Pay requests authorized in the Contract Clause entitled "Payments Under Fixed-Price Construction Contracts", will be paid pursuant to the clause entitled "Prompt Payment for Construction Contracts". Pay requests shall be submitted on ENG Form 93 and 93a, "Payment Estimate-Contract Performance" and "Continuation", respectively. All information and substantiation required by the identified contract clauses shall be submitted with the ENG Form 93, and the required certification shall be included on the last page of the ENG Form 93a, signed by an authorized official of the Contractor and dated when signed. The designated billing office is the Office of the Area Engineer.

3. PHYSICAL DATA (APR 1984). FAR 52.236-4. Data and information furnished or referred to below is furnished for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

a. Physical Conditions. The indications of physical conditions on the drawings and in the specifications are the result of site investigations by surveys and borings. Information regarding these borings and additional information regarding shear, and other test results are available for inspection upon 48 hours notice at the Dept. of the Army, St. Louis District, Corps of Engineers, 1222 Spruce Street, St. Louis, Missouri. The Government has acquired permits pertaining specifically to this contract. After award a copy of each permit will be provided to the Contractor. A listing of permits acquired by the Government is as follows:

(1) National Pollution Discharge Elimination System (NPDES)

(2) Section 404 of the Clean Water Act

(3) Section 401 Water Quality Certification

b. Weather Conditions. Information with respect to temperatures and precipitation may be obtained from the National Weather Service.

c. Transportation Facilities. Railroads and highways serve the general area of the work.

4. RIGHT-OF-WAY.

a. Right-of-way for construction purposes will be furnished by the Government without cost to the Contractor. Where right-of-way for access to a work site is not available over existing public roads, access through private lands as shown on the contract drawings will be furnished by the Government without cost to the Contractor. If the right-of-way furnished for access is used, the Contractor will be required at its own expense, to do all work necessary to make such right-of-way suitable for traveling to and from

the work site without interrupting the existing drainage. Upon completion of the contract work, any such access roadway and right-of-way furnished by the Government shall be left in a condition satisfactory to the Contracting Officer.

b. The Contractor shall procure without expense to the Government all additional lands, access roads, or right-of-way necessary for its use in the performance of the work. Any agreements or permits with levee boards, counties, or political subdivisions for moving material and equipment will also be the responsibility of the Contractor. Any delays to the Contractor resulting from delays in procuring such additional lands, access roads, right-of-way, or permits for moving material and equipment for its own use will not be made a basis of any claim for increases in the cost of performance of the work. The Contractor shall make its own investigations to determine the conditions, restrictions, and difficulties which may be encountered in the transportation of material and equipment to the work sites shown on the drawings.

5. PUBLIC UTILITIES AND PRIVATE IMPROVEMENTS.

a. Unless otherwise specified, shown on the drawings, or stated in writing by the Contracting Officer, the Contractor shall not move or disturb any public utilities or private improvements. Such removals, alterations, and/or relocations, where necessary, will be made by others. The locations shown on the drawings for underground utilities are approximate only. The exact locations of such utilities shall be determined by the Contractor in the field prior to commencing construction operations in their vicinity.

b. The attention of the Contractor is directed to the possibility that public utilities or private improvements may be encountered within the construction limits, some of which may be buried, and the existence of which is presently not known. Should any such utilities or improvements be encountered, the Contractor shall immediately notify the Contracting Officer so that a determination may be made as to whether they shall be removed, relocated, or altered. After such determination is made, the Contractor shall, if so directed by the Contracting Officer, remove, relocate, or alter them as required and an equitable adjustment will be made. In the event the Contracting Officer arranges for such removals, alterations, or relocations to be performed by others, the Contractor shall cooperate with such others during the latters' removal, alteration, or relocation operations.

6. DAMAGE TO WORK. The responsibility for damage to any part of the permanent work shall be as set forth in the Contract Clause entitled "Permits and Responsibilities." However, if in the judgment of the Contracting Officer any part of the permanent work performed by the Contractor is damaged by flood or earthquake, which damage is not due to the failure of the Contractor to take reasonable precautions or to exercise sound engineering and construction practices in the conduct of the work, the Contractor shall make the repairs as ordered by the Contracting Officer and full compensation for such repairs will be made at the applicable contract unit or lump sum prices as fixed and established in the contract. If in the opinion of the Contracting Officer there are no contract unit or lump sum prices applicable to any part of such work, an equitable adjustment pursuant to the Contract Clause entitled, "Changes," of the contract will be made as full compensation for the repairs of that part of the permanent work for which there are no applicable contract unit or lump sum prices. Except as herein provided, damage to all work

(including temporary construction), utilities, materials, equipment, and plant shall be repaired to the satisfaction of the Contracting Officer at the Contractor's expense, regardless of the cause of such damage.

7. LAYOUT OF WORK.

a. The Government will establish the following at the site of the work:

(1) The Government will field stake the location of each well as specified in the table located at the end of SECTION 02715 - RELIEF WELLS.

(2) The Government will provide two benchmarks, one at the upstream and one at the downstream limits of the relief well contract. The Contractor is responsible for transferring elevations to each drilling location.

(3) The Government will provide two horizontal control points. From these the Contractor is responsible for the layout of work.

b. From the horizontal control points and bench marks established by the Government, the Contractor shall complete the layout of the work and shall be responsible for all measurements that may be required for the execution of the work to the location and limit marks prescribed in the specifications or on the contract drawings, subject to such modifications as the Contracting Officer may require to meet changed conditions or as a result of necessary modifications to the contract work.

c. The Contractor shall furnish at its own expense such stakes, templates, platforms, equipment, tools and material, and all labor as may be required in laying out any part of the work from the base lines and bench marks established by the Government. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other marks established by the Contracting Officer until authorized to remove them, and if such marks are destroyed by the Contractor or through its negligence prior to their authorized removal, they may be replaced by and at the discretion of, the Contracting Officer, and the expense of replacement will be deducted from any amounts due or to become due the Contractor. The Contracting Officer may require that work be suspended at any time when location and limit marks established by the Contractor are not reasonably adequate to permit checking of the work.

8. NOT USED.

9. PARTIAL PAYMENT. At the discretion of the Contracting Officer, partial payment will be made for equipment delivered and stored on site or off site providing such storage is in accordance with the provisions of these specifications and the Contractor furnishes satisfactory evidence that title to such equipment has been acquired and that it will be utilized on the work covered by these specifications. Partial payment is defined as the invoice amount plus shipping costs. If the equipment is stored off site, the Government shall have the right to inspect the equipment.

10. CERTIFICATES OF COMPLIANCE. Any certificates required for demonstrating proof of compliance of materials with specification requirements shall be executed in 3 copies. Each certificate shall include the signature

and title of an official authorized to certify in behalf of the manufacturing company and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from responsibility for furnishing satisfactory material if, after tests are performed on selected samples, the material is found not to meet the specific requirements.

11. PURCHASE ORDERS. Two copies of all purchase orders for other than stock materials showing the firm names and addresses and list of material shall be furnished to the Contracting Officer or an authorized representative as soon as issued.

12. SAFETY AND HEALTH REQUIREMENTS MANUAL EM 385-1-1. The Safety and Health Requirements Manual EM 385-1-1 forms a part of these specifications. EM 385-1-1 and its changes are available at http://www.hq.usace.army.mil (at the HQ homepage, select Safety and Occupational Health). The Contractor shall be responsible for complying with the current edition and all changes posted on the web as of the effective date of this solicitation. EM 385-1-1 is provided on the CD-ROM and the St. Louis District web site for each solicitation, however the Contractor shall be responsible for obtaining any changes to the manual, which are available on the above web site.

13. ACCIDENT INVESTIGATIONS AND REPORTING. Refer to EM 385-1-1, Paragraph 01.D. Accidents shall be investigated and reports completed by the immediate supervisor of the employee(s) involved and reported to the Contracting Officer or an authorized representative within one working day after the accident occurs. The accident Investigation report shall be made on ENG Form 3394.

14. ACCIDENT PREVENTION PROGRAM. Refer to Contract Clause FAR 52.236-13 entitled, "Accident Prevention". Within 15 days after receipt of Notice of Award of the contract, and at least 7 days prior to the prework conference, the original and one copy of the Accident Prevention Program shall be submitted to the Contracting Officer for review. The program shall be prepared in the following format:

a. An executed MVS Form 385-33, Administrative Plan.

b. An executed MVS Form 385-359-R, Hazard Analysis.

c. A copy of company policy statement of accident prevention and any other guidance statements normally provided new employees. Each company employee shall be required to sign the company policy statement of accident prevention to verify that all employees have been informed of the safety program, and such signed statements shall be maintained at the project site.

d. When marine plant and equipment are in use under a contract, the method of fuel oil transfer shall be included on MVS Form 385-22, Fuel Oil Transfer (refer to 33 CFR 156).

The Contractor shall not commence physical work at the site until the program has been reviewed and found acceptable by the Contracting Officer, or an authorized representative. At the Contracting Officer's discretion, the Contractor may submit its Activity Hazard Analysis only for the first phase of

construction provided that it is accompanied by an outline of the remaining phases of construction. All remaining phases shall be submitted and accepted prior to the beginning of work in each phase. Also refer to Section 1 of EM 385-1-1.

15. DAILY INSPECTIONS. The Contractor shall perform daily safety inspections and record them on the forms approved by the Contracting Officer. Reports of daily inspections shall be maintained at the job site. The reports shall be records of the daily inspections and resulting actions. Each report shall include, as a minimum, the following:

a. Phase(s) of construction underway during the inspection.

b. Locations of areas inspections were made.

c. Results of inspection, including nature of deficiencies observed and corrective actions taken, or to be taken, date, and signature of the person responsible for its contents.

16. ENVIRONMENTAL LITIGATION.

(a) If the performance of all or any part of the work is ordered by a court of competent jurisdiction to be suspended, delayed, or interrupted as a result of environmental litigation, as defined below, the Contracting Officer, at the request of the Contractor, shall determine whether the order is due in any part to the acts or omissions of the Contractor or a Subcontractor at any tier not required by the terms of this contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor or a Subcontractor at any tier other than as required by the terms of this contract, such suspension, delay, or interruption shall be considered as if ordered by the Contracting Officer in the administration of this contract under the terms of the Contract Clause entitled "Suspension of Work".

(b) The term "environmental litigation", as used herein, means a lawsuit alleging that the work will have an adverse effect on the environment or that the Government has not duly considered, either substantively or procedurally, the effect of the work on the environment.

17. TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER.

a. This provision specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the Contract Clause entitled, "Default (Fixed-Price Construction)". In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

(1) The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

(2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

b. The following schedule of monthly anticipated adverse

weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
(5)	(6)	(7)	(6)	(7)	(8)	(8)	(9)	(6)	(6)	(7)	(7)

c. Upon acknowledgement of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor shall record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled work day. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph b, above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the Contract Clause entitled "Default (Fixed Price Construction)".

18. SUBCONTRACTS. In accordance with the Contract Clause entitled "Subcontracts", the Contractor shall, within seven days after the award of any subcontract by the Contractor or a Subcontractor, deliver to the Contracting Officer two copies of a completed Standard Form 1413. Both copies must contain the original signatures of both parties.

19. REQUIRED INSURANCE - WORK ON A NON-GOVERNMENT INSTALLATION.

a. The Contractor shall, at its own expense, provide and maintain during the entire performance period of this contact at least the kinds and minimum amounts of insurance required in the following schedule:

(1) Workmen's Compensation. Amounts required by applicable jurisdictional statutes.

(2) Employer's Liability Insurance. $100,000

(3) Comprehensive General Liability Insurance.

Bodily Injury - $500,000 per occurrence

(4) Comprehensive Automobile Insurance.

Bodily Injury - $200,000 each person
$500,000 each accident
Property Damage - $ 20,000 each accident

b. Within 15 days after receipt of Notice of Award and before commencing work under this contract, the Contractor shall notify the

Contracting Officer in writing that the required insurance has been obtained. The policies evidencing required insurance shall contain an endorsement to the effect that any cancellation or any material change adversely affecting the Government's interest shall not be effective (1) for such period as the laws of the State in which this contract is to be performed prescribe, or (2) until 30 days after the insurer or the Contractor gives written notice to the Contracting Officer, whichever period is longer.

c. The Contractor shall insert the substance of this clause, including this paragraph c, in subcontracts under this contract and shall require subcontractors to provide and maintain the insurance required in paragraph a above. The Contractor shall maintain a copy of all subcontractor's proofs of required insurance, and shall make copies available to the Contracting Officer upon request.

d. Statements of insurance should be submitted to the following address:

Department of the Army
St. Louis District, Corps of Engineers
Central Area Office; CEMVS-CO-CA
301 Riverlands Way
West Alton, Missouri 63386

20. PROTECTION OF MATERIAL AND WORK. The Contractor shall at all times protect and preserve all materials, supplies, and equipment of every description (including property which may be Government-furnished or owned) and all work performed. All reasonable requests of the Contracting Officer to enclose or specially protect such property shall be complied with. If, as determined by the Contracting Officer, material, equipment, supplies, and work performed are not adequately protected by the Contractor, such property may be protected by the Government and the cost thereof may be charged to the Contractor or deducted from any payments due to the Contractor.

21. CONTAMINATION OF WATER. In addition to the requirements set forth in 01130-3.3, Protection of Water Resources, the Contractor shall take positive protective measures to prevent spillage of potential pollutant materials such as fuel, emulsion materials, chemicals etc., from storage containers or equipment, into lakes or tributary waters. Such positive protective measures may include, but not limited to, the following:

(1) A berm enclosure of sufficient capacity to contain such materials.

(2) Security measures to prevent acts of vandalism which could result in spillage of such materials (fences, guards, etc.).

(3) Storage of such materials in an area where the terrain would preclude leakage into lake or tributary waters.

(4) Utilization of secure Government storage areas if the Contracting Officer indicates such space is available. No storage past immediate needs (2 days) without the consent of the Contracting Officer.

The Contractor shall submit its proposals for implementing the above provisions in accordance with 01130-1.5, Environmental Protection Plan.

22. COMMERCIAL WARRANTY. The Contractor agrees that the standard commercial equipment furnished under this contract shall be covered by the most favorable commercial warranties the manufacturer gives to any customer for such equipment, and that the rights and remedies provided herein are in addition to and do not limit any rights afforded to the Government by any other clause of this contract. The Contractor shall furnish two copies of the warranties to the Contracting Officer.

23. ORDER AND COORDINATION OF WORK. The Contractor may start and complete the work in such order and sequence as desired subject to compliance with the following paragraphs:

a. Mandatory Order of Work.

(1) No physical work and/or vehicles shall be permitted on the golf course prior to November 1, 2002 and all physical work shall be completed by March 31, 2003. The Contracting Officer may grant approval for the Contractor to perform surveys and inspections prior to November 1, 2002 if the Contractor's work does not interfere with golf course activities and schedules.

(2) As the first order of work, the Contractor shall field verify all existing feature locations and elevations and all proposed work locations and elevations of all work to be performed in accordance with the contract plans and specifications. Prior to initiating any drilling and excavations, the Contractor shall locate any and all existing pipelines, power, water, sewer, telephone utility lines, communication lines, and sprinkler system pipes, sprinkler heads, and control wiring for the sprinkler system.

(3) As the second order of work, the Contractor shall furnish and deliver on site or at "Repair Unit Land" as approved by the Contracting Officer all well screen, riser pipe, blanks, and filter pack materials required to complete all new relief wells prior to initiating any relief well drilling. The new relief wells (RW) to be constructed under this contract are designated as RW-214, RW-215, RW-216, RW-217, RW-218, RW-219, RW-220, RW-221, RW-222 as shown in TABLE 1 located at the end of SECTION 02715 - RELIEF WELLS and as shown on the drawings. A detailed Schedule of Materials, describing the length of each section of well screen and riser pipe used to meet the total lengths specified for each well in the table, shall be included with the Shop Drawing submittal required in SECTION 02715 - RELIEF WELLS. The Contractor may use the Government compound formerly designated as the "Repair Unit Land," located in Granite City, Illinois as a storage site and staging area. The Government does not accept any responsibility for any damage or theft of material or equipment that the Contractor elects to store at the Government compound.

(4) As the third order of work, the Contractor shall install and develop the new relief wells beginning with RW-214 and continuing in consecutive order to RW-222. After the Contractor completes the installation and development of relief wells numbered RW-214 through RW-222, the Contractor may initiate the fourth order of work concurrently with the remainder of the third order of work.

(5) As the fourth order of work, the Contractor shall completely finish Collector Number (No.) 1 (C1) starting at the existing manhole, south collector discharge junction, at collector station 0+00 C1 and

continuing up gradient sequentially to RW-222.

(6) The Contractor shall initiate the abandonment and removal of existing relief well RW-6 no sooner than December 1, 2002. The abandonment and removal includes disposal of the pump house enclosure, slab, and foundation for RW-6 as well as all pumps, piping, pump controls, electrical switch gear, and wiring. The Contractor shall completely fill relief well RW-6 with concrete up to within three feet of the ground surface, remove the relief well riser pipes to depths no less than three feet below the ground surface, and backfill the excavations with compacted clay.

(7) All excess and unsuitable excavated materials shall be disposed on the golf course property as shown on the drawings. The actual disposal area(s) will be determined by the Contracting Officer.

b. Coordination. The Contractor shall coordinate, as necessary for the various phases of work, with the following Points of Contact (POC):

Illinois Power Company: Dan Elliot 618-346-1241

Rivers Edge Golf Course: Kerry Gerber, 314-565-4664

Rivers Project Office: John Cannon, 636-899-2600, ext 239

Tri-City Port Authority: Jim Labit, 618-452-3337

c. River Stage Limitations. Construction operations may be prevented due to high Mississippi River stages beginning when the St. Louis Gage rises to 25 feet and above. The Contractor shall examine the National Weather Service 3-day forecast for the St. Louis Gage daily to be alerted to possible high river stages and to prepare for preventing damage to already completed work. Construction operations shall cease when the St. Louis Gage rises to 30.0 feet and above. At high river stages above 30 feet on the St. Louis Gage, the Contractor may be directed by the Contracting Officer to perform emergency actions to prevent uncontrolled seepage from occurring. The Contracting Officer will determine the extent of the delay to the work due to high Mississippi River stages, and the time fixed for completion of the contract will be extended for the period of the time delay, in accordance with Section 00700, Contract Clause entitled, “Default”.

d. Protection of the Golf Course Sprinkler System. The Contractor shall field locate all sprinkler heads, piping, and wiring within the construction limits and document the sprinkler conditions prior to initiating work. **The Contractor shall minimize damages on the sprinkler system to the greatest extent possible.** If the sprinkler system is damaged while excavating within the construction limits, the Contractor shall flag all locations where the damage has occurred to the sprinkler system heads, piping, wiring, and other components to allow the sprinkler system repair crews to assess the damages and proceed with repairs. The Contractor shall notify the Contracting Officer and the golf course manager within 24 hours after the damage occurs. The Contractor will not be liable for the repair costs within the construction limits. If the sprinkler system is damaged outside the construction limits, for whatever reason, the Contractor shall be responsible for the repair costs.

24. AS-BUILT DRAWINGS.

a. "As-Built" Contract Drawings. The Contractor shall maintain a

separate set of full-size contract drawings, marked up in red, to indicate as-built conditions. Each as-built contract drawing shall include the Contract Number (DACW43-XX-C-XXXX) associated with the contract. These drawings shall be maintained in a current condition at all times until completion of the work and shall be available for review by Government personnel at all times. All variations from the contract drawings, for whatever reason, including those occasioned by modifications, optional materials, and the required coordination between trades, shall be indicated. These variations shall be shown in the same general detail utilized in the contract drawings. Upon completion of the work, two (2) sets of the marked-up drawings shall be furnished to the Contracting Officer prior to acceptance of the work. The Government will withhold two percent of the total bid price of the items for which as-built contract drawings have not been submitted.

b. "As-Built" Shop Drawings. Upon completion of items of work, the Contractor shall revise the shop drawings to show "as-built" conditions. The notation "Revised to show 'as-built' conditions" shall be placed in red in the lower right corner of each drawing along with the initials of a responsible company representative. Each as-built shop drawing or catalog cut shall be identified by the Contract Number (DACW43-XX-C-XXXX) associated with the contract, and corresponding transmittal number from ENG Form 4025. "As-built" shop drawings of each Contractor-prepared construction drawing should be prepared as soon as possible after the construction detailed on a given drawing has been completed. After the "as-built" shop drawings have been prepared as described above and within 15 days after the contract completion date, the Contractor shall submit two (2) complete sets of as-built shop drawings, including catalog cuts, to the Contracting Officer. The Government will withhold two percent of the total bid price of the item for which as-built shop drawings have not been submitted.

25. DAMAGE TO ROADS. The Contractor shall be responsible for damage to roads and highways used for hauling construction equipment or materials. Prior to completion of the contract, such roads shall be restored to the existing condition of the road before the damage occurred.

26. THRU 34. NOT USED

35. HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997). FAR 52.223-3

(a) "Hazardous material", as used in this clause, includes any material defined as hazardous under the latest version of 29 CFR 1910.1200(g) (including revisions adopted during the term of the contract).

(b) The offeror must list any hazardous material, as defined in paragraph (a) of this clause, to be delivered under this contract. The hazardous material shall be properly identified and include any applicable identification number, such as National Stock Number or Special Item Number This information shall also be included on the Material Safety Data Sheet submitted under this contract.

Material (If none, insert "None")	Identification No.
_____	_____
_____	_____

(c) This list must be updated during performance of the contract whenever the Contractor determines that any other material to be delivered under this contract is hazardous.

(d) The apparently successful offeror agrees to submit, for each item as required prior to award, a Material Safety Data Sheet, meeting the requirements of 29 CFR 1910.1200(g) for all hazardous material identified in paragraph (b) of this clause. Data shall be submitted in accordance with 29 CFR 1910.1200(g), whether or not the apparently successful offeror is the actual manufacturer of these items. Failure to submit the Material Safety Data Sheet prior to award may result in the apparently successful offeror being considered nonresponsive and ineligible for award.

(e) If, after award, there is a change in the composition of the item(s) or a revision to 29 CFR 1910.1200(g), which renders incomplete or inaccurate the data submitted under paragraph (d) of this clause, the Contractor shall promptly notify the Contracting Officer and resubmit the data.

(f) Neither the requirements of this clause nor any act or failure to act by the Government shall relieve the Contractor of any responsibility or liability for the safety of Government, Contractor, or subcontractor personnel or property.

(g) Nothing contained in this clause shall relieve the Contractor from complying with applicable Federal, State, and local laws, codes, ordinances, and regulations (including the obtaining of licenses and permits) in connection with hazardous material.

(h) The Government's rights in data furnished under this contract with respect to hazardous material are as follows:

(1) To use, duplicate and disclose any data to which this clause is applicable. The purposes of this right are to--

(i) Apprise personnel of the hazards to which they may be exposed in using, handling, packaging, transporting, or disposing of hazardous materials;

(ii) Obtain medical treatment for those affected by the material; and

(iii) Have others use, duplicate, and disclose the data for the Government for these purposes.

(2) To use, duplicate, and disclose data furnished under this clause, in accordance with subparagraph (h)(l) of this clause, in precedence over any other clause of this contract providing for rights in data.

(3) The Government is not precluded from using similar or identical data acquired from other sources.

36. PARTNERING. In order to most effectively accomplish this contract, the Government is willing to form a cohesive partnership with the Contractor. This partnership would strive to draw on the strengths of each organization in an effort to achieve a quality project done right the first

time, within budget, and on schedule. This partnership would be bilateral in make-up and partnership will be totally voluntary. Any cost associated with effectuating this partnership will be agreed to by all parties and will be shared equally with no change in contract price.

37. SECTION 8(a) DIRECT AWARD. DFARS 252.219-7009

(a) This contract is issued as a direct award between the contracting office and the 8(a) Contractor pursuant to the Memorandum of Understanding dated May 6, 1998, between the Small Business Administration (SBA) and the Department of Defense. Accordingly, the SBA is not a party to this contract. SBA does retain responsibility for 8(a) certification, 8(a) eligibility determinations and related issues, and for providing counseling and assistance to the 8(a) Contractor under the 8(a) Program. The cognizant SBA office is:

US Small Business Administration
St. Louis District Office
815 Olive Street Room 242
St. Louis, MO 63101-1569

(b) The contracting office is responsible for administering the contract and for taking any action on behalf of the Government under the terms and conditions of the contract; provided that the contracting office shall give advance notice to the SBA before it issues a final notice terminating performance, either in whole or in part, under the contract. The contracting office also shall coordinate with the SBA prior to processing any novation agreement. The contracting office may assign contract administration functions to a contract administration office.

(c) The Contractor agrees that--

(1) It will notify the Contracting Officer, simultaneous with its notification to the SBA (as required by SBA's 8(a) regulations at 13 CFR 124.308), when the owner or owners upon whom 8(a) eligibility is based plan to relinquish ownership or control of the concern. Consistent with Section 407 of Pub. L. 100-656, transfer of ownership or control shall result in termination of the contract for convenience, unless the SBA waives the requirement for termination prior to the actual relinquishing of ownership and control; and

(2) It will not subcontract the performance of any of the requirements of this contract without the prior written approval of the SBA and the Contracting Officer.

38. CHANGES IN PERFORMANCE OF WORK AS NEGOTIATED. The Contractor shall beforehand notify the Contracting Officer, in writing, of any change or substitution in utilization of a subcontractor, supplier, etc., from that which was relied on by the Government during the cost and pricing negotiation. Such notification shall include: 1) the name of the new subcontractor, supplier, etc.; 2) the work to be performed or material supplied; 3) the reason for the substitution and; 4) whether the Contractor's costs will remain the same, increase, or decrease as a result of the change. This notification shall also be applicable if the change results in work to be performed or material or equipment to be supplied by the Contractor.

-END OF SECTION 00800-

ACCIDENT PREVENTION PROGRAM
ADMINISTRATIVE PLAN

1. Contractor	2. Contract Name & No.		3. Date
4. Project Superintendent	5. Shift/day	5a. Hours/shift	5b. Maximum employees/shift

6a. TRAINING - List subjects to be discussed with employees in safety indoctrination.

6b. TRAINING - List mandatory training and certifications which are applicable to this project (e.g., explosive actuated tools, confined space entry, crane operator, diver, vehicle operator, etc.)

7. Responsibility & Authority - Who is responsible for safety?

Project: Corporate: Line of Authority?

8. Who will conduct safety inspection?	8a. How	8b. When
9a. Is safety & health policy attached?	9b. Is safety program attached?	9c. Day & hour weekly safety meeting

10. How will subcontractor & supplies be controlled?	11. What are their safety responsibilities?

12. Who will report accidents, exposure data?

13. MEDICAL SUPPORT. Outline on-site medical support and off-site medical arrangements.

14. Outline procedures for conducting hazard assessments & written certification of PPE	Who?	When?	How?

15. Names of first aid attendants having certificates	Type of certificate & expiration date	Names of USCG licensed boat operators. Type license & expiration date.

On a separate sheet submit your proposed layout of temporary buildings and facilities (including subcontractors) and traffic patterns including access roads, haul roads, R.R.s. utilities, etc.

The _____ will pursue a positive program of training,, inspections
(Company)
and hazard control throughout the term of this contract. Mr./Ms. _____ has

the responsibility and authority for enforcing them.

_____	_____	_____	_____
Contractor-s Signature	Date	C.O. or C.O.R. Signature	Date

ACCIDENT PREVENTION PROGRAM
HAZARD ANALYSIS

1. Contract No.	2. Project	3. Facility
4. Date	5. Location	6. Estimated Start Date
7. PRINCIPAL STEPS	8. POTENTIAL HAZARDS	9. RECOMMENDED CONTROLS
10. EQUIPMENT TO BE USED	11. INSPECTION REQUIREMENTS	12. TRAINING REQUIREMENTS
14. Report discussed with contractor/superintendent on _____ _____ Area/Resident Engineer (Signature)		15. Contracting Officer (Signature & Date) or Contracting Officer Representative

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INDEX

DIVISION 1 - GENERAL REQUIREMENTS

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SECTION 01025 - MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 MOBILIZATION AND DEMOBILIZATION. Mobilization and demobilization will not be measured for payment. Payment for costs associated with mobilization and demobilization will be made at the contract lump sum price for "Mobilization and Demobilization", as defined in the Contract Clauses, SECTION 00700.

1.2 STRIPPING. Payment for stripping will be made at the contract lump sum price for “Stripping”, which price and payment shall constitute full compensation for all costs of the plant, labor, materials and equipment associated with stripping as specified in SECTION 02110 – STRIPPING, and as shown on the drawings.

1.3 CARE OF WATER. Payment for care of water will be made at the contract lump sum price for “Care of Water”, which price and payment shall constitute full compensation for all costs of the plant, labor, materials and equipment associated with care of water as specified in SECTION 02140 – CARE OF WATER, and as shown on the drawings.

1.4 WELL SCREEN. Stainless steel well screen will be measured for payment by the linear foot of well screen furnished. Payment will be made at the contract unit price per linear foot for "Well Screen"; which price and payment shall constitute full compensation for furnishing the screen as specified in SECTION 02715 – RELIEF WELLS.

1.5 RISER PIPE. Riser pipe will be measured for payment by the linear foot of riser pipe furnished. Payment will be made at the contract unit price, per linear foot for "Riser Pipe"; which price and payment shall constitute full compensation for furnishing the riser pipe as specified in SECTION 02715 – RELIEF WELLS.

1.6 WELL DRILLING. Well drilling will be measured for payment by the linear foot of completed well hole from the top of natural ground or embankment/berm to depth shown in SECTION 02715 - RELIEF WELLS, Table 1. Payment will be made at the applicable contract unit price, per linear foot for "Well Drilling”, which prices and payments shall constitute full compensation for drilling the well as specified in SECTION 02715 – RELIEF WELLS.

1.7 WELL INSTALLATION. Well installation will be measured for payment by the linear foot of well from the top of permanent riser to the depth of the screen specified in SECTION 02715 - RELIEF WELLS, Table 1. Payment will be made at the applicable contract unit price per linear foot, as follows: "Well Installation”, which prices and payments shall constitute full compensation for assembling and installing the well screen, permanent riser pipe, gravel pack materials, check valves, concrete backfill and pad and all other work as specified in SECTION 02715 – RELIEF WELLS and SECTION 03310 – RELIEF WELL CONCRETE.

1.8 WELL ABANDONMENT. Wells ordered abandoned by the Contracting Officer before installation of well screen and riser due to no fault of the Contractor will be paid for at the contract unit price, per linear foot, for "Well Abandonment", which prices and payments shall constitute full compensation for abandoning the well, as specified in SECTION 02715 – RELIEF WELLS based on the actual well depth. Wells ordered abandoned by the Contracting Officer after installation of well screen and riser due to no fault of the Contractor will be paid for at the applicable contract unit price per linear foot for "Well Screen", "Riser Pipe", "Well Abandonment", "Well Drilling", and "Well Installation"; and based on the actual number of feet of well screen, and riser pipe actually placed. No payment will be made for placement or replacement of temporary drilling casings or repair of damage resulting from Contractor operations.

1.9 WELL DEVELOPMENT. Well development will be measured for payment for each hour, measured to the nearest 15 minutes, of actual well development successfully performed. Cost for equipment setup and dismantling shall be included in the hourly cost for jetting and airlifting and will not be paid for separately. Well development will be paid for at the applicable contract unit price per hour for "Well Development", which prices and payments shall constitute full compensation for all costs of plant, labor, materials, and equipment necessary to develop each relief well as specified in SECTION 02715 – RELIEF WELLS.

1.10 PUMPING TESTS. Pumping tests will be measured for payment for each hour, measured to the nearest 15 minutes, of pumping test successfully performed as specified in SECTION 02715 - RELIEF WELLS, Para 3.6, and as otherwise directed by the Contracting Officer. Payment for pumping tests will be made at the applicable contract unit price per hour for "Pumping Tests", which prices and payments shall constitute full compensation for all costs necessary to perform satisfactory pumping tests as specified in SECTION 02715 – RELIEF WELLS. The cost for placing and removal of equipment shall be included in the per hourly cost and will not be paid for separately. No payment will be made for pumping tests not successfully completed.

1.11 RELIEF WELL COLLECTOR SYSTEM. Payment for the collector system will be made at the contract lump sum price for "Relief Well Collector System", which price and payment shall constitute full compensation for all costs of the plant, labor, materials and equipment associated with the relief well collector systems as specified in the applicable parts of SECTION 02200 - EARTHWORK; SECTION 02240 – GEOTEXTILE AND SILT FILTER FENCING; SECTION 02715 – RELIEF WELLS; SECTION 02720 - RELIEF WELL COLLECTOR SYSTEM; SECTION 03300 – CAST-IN-PLACE CONCRETE; SECTION 03310 – RELIEF WELL CONCRETE; SECTION 03425 – PRECAST CONCRETE and as shown on the drawings.

1.12 MANHOLE REPAIR. Manhole repair will be made at the contract lump sum price for "Manhole Repair", which price and payment shall constitute full compensation for all costs of the plant, labor, materials and equipment associated with the manhole repair as specified in the applicable parts of SECTION 02200 - EARTHWORK; SECTION 02240 – GEOTEXTILE AND SILT FILTER FENCING; SECTION 02715 – RELIEF WELLS; SECTION 02720 - RELIEF WELL COLLECTOR SYSTEM;

SECTION 03300 – CAST-IN-PLACE CONCRETE; SECTION 03310 – RELIEF WELL CONCRETE; SECTION 03425 – PRECAST CONCRETE and as shown on the drawings.

1.13 SILT FILTER FENCING. Payment for silt filter fencing will be made by the linear foot of silt filter fencing as specified in SECTION 02240 - GEOTEXTILE AND SILT FILTER FENCING. Payment will be made at the applicable contract price per linear foot for "Silt Filter Fencing"; which price and payment shall constitute full compensation for all costs of the plant, labor, materials and equipment associated with silt filter fencing as specified in SECTION 02240 – GEOTEXTILE AND SILT FILTER FENCING.

1.14 BONDING. Costs for Bonding will not be measured for payment. Payment for costs associated with bonding will be made at the contract lump sum price for "Bonding", as defined in the Contract Clauses, SECTION 00700.

1.15 REMOVALS. Payment for removals will be made at the contract lump sum price for “Removals”, which price and payment shall constitute full compensation for all costs of the plant, labor, materials and equipment associated with removals as specified in the applicable parts of SECTION 02070 – REMOVALS and as shown on the drawings.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

-END OF SECTION 01025-

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(16-01) (2AM)

SUBMITTAL REGISTER
(ER 415-1-10)

CONTRACT NO.

TITLE AND LOCATION CHARLES MELVIN PRICE SUPPORT CENTER (CMPSC)
RELIEF WELLS

CONTRACTOR

SPECIFICATION SECTION

					TYPE OF SUBMITTAL										CLASSI-FICATION			CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		
ACTIVITY NO a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	REPORTS k.	CERTIFICATES l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	DATE w.	SUBMIT TO GOVERN-MENT x.	CODE y.	DATE z.	REMARKS aa.
			02110.1.2	CERTIFICATES							X				X											
			02140.1.3	CARE OF WATER PLAN					X							X										
			02200-1.4.1	REPLACEMENT & COMPACTION CERT						X					X											
			02200-1.4.2	EXCAVATION PLAN					X							X										
			02200-1.4.3	SHORING & TRENCHING PLAN					X							X										
			02200-1.4.4	FILL & BACKFILL PLAN					X							X										
			02200-1.4.5	GRADATION					X						X											
			02240-1.4.1	GEOTEXTILE CERTIFICATE							X					X										
			02240-1.4.2	SILT FILTER FENCING							X					X										
			02240-1.4.3	METHOD OF INSTALLATION					X						X											
			02715-1.4.1	RELIEF WELL DETAILS		X										X										
			02715-1.4.2	WELL DRILLING SPECIALIST					X							X										
			02720-1.3.1	PLACING PIPE AND ALIGNMENT PLAN			X									X										
			02720-1.3.2	PIPE CERTIFICATION							X					X										
			02720-1.3.3	MANHOLE CERTIFICATION							X					X										
			02720-1.3.4	PREFORMED FLEXIBLE JOINT SEALANT							X					X										

(16-01)(2AM)

SUBMITTAL REGISTER
(ER 415-1-10)

CONTRACT NO.

TITLE AND LOCATION CHARLES MELVIN PRICE SUPPORT CENTER (CMPSC)
RELIEF WELLS

CONTRACTOR

SPECIFICATION SECTION

					TYPE OF SUBMITTAL										CLASSIFICATION			CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		
ACTIVITY NO a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	REPORTS k.	CERTIFICATES l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	DATE w.	SUBMIT TO GOVERN-MENT x.	CODE y.	DATE z.	REMARKS aa.
			03101-1.6.1	DESIGN COMPUTATIONS FOR FORMWORK		X										X										
			03101-1.6.2	MANUFACTURER'S LITERATURE	X										X											
			03150-1.4.1	PREMOLDED EXPANSION JOINT FILLER STRIPS						X					X												
			03150-1.4.2	SEALANTS & PRIMER								X			X												
			03210-1.4.1	FABRICATION & PLACEMENT		X										X										
			03210-1.4.2	MATERIALS						X					X												
			03210-1.4.3	WELDED WIRE FABRIC							X				X												
			03300-1.6.1	CONCRETE MIX PROPORTIONS	X											X										
			03300-1.6.2	CEMENTITIOUS MATERIAL, NON SHRINK GROUT, ADMIXTURES, & CURING COMPOINDS						X	X				X												
			03300-1.6.3	PLANT, EQUIPMENT, & METHODS	X										X												
			03300-1.6.4	PLACEMENT PROCEDURES					X							X											
			03310-1-5.1.1	CEMENTITIOUS MATERIAL						X					X												
			03310-1.5.1.2	AGGREGATES						X					X												
			03310-1.5.2	MANUFACTURER'S LITERATURE	X										X												
			03310-1.5.3	CONCRETE MIX PROPORTIONS							X					X											

(16-01)(2AM)

SUBMITTAL REGISTER
(ER 415-1-10)

CONTRACT NO.

TITLE AND LOCATION CHARLES MELVIN PRICE SUPPORT CENTER (CMPSC)
RELIEF WELLS

CONTRACTOR

SPECIFICATION SECTION

					TYPE OF SUBMITTAL										CLASSIFICATION			CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		
ACTIVITY NO a.	TRANSMITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	REPORTS k.	CERTIFICATES l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	DATE w.	SUBMIT TO GOVERNMENT x.	CODE y.	DATE z.	REMARKS aa.
			03425-1.4.1	CONCRETE MIXTURE PROPORTIONS	X											X										
			03425-1.4.2	DETAILS AND MATERIALS		X										X										
			03425.1.4.3	CONCRETE TESTS						X					X											
			03425-1.4.4.1	CEMENT							X				X											
			03425-1.4.4.2	POZZOLAN							X				X											
			03425-1.4.4.3	AIR-ENTRAINING ADMIXTURE							X				X											
			03425-1.4.4.4	WATER-REDUCING ADMIXTURE							X				X											
			03425-1.4.4.5	ACCELERATING ADMIXTURE							X				X											
			03425-1.4.4.6	AGGREGATES							X				X											
			03425-1.4.4.7	AIR CONTENT							X				X											
			03425-1.4.4.8	NON-SHRINK GROUT							X				X											
			03425-1.4.5	CONSTRUCTION RECORDS									X		X											

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DIVISION 1 – GENERAL REQUIREMENTS

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SECTION 01500 - TEMPORARY CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS. As soon as practicable, but not later than 15 days after the date established for commencement of work, the Contractor shall provide the temporary facilities specified herein. The temporary facilities shall be maintained by the Contractor during the life of the contract and upon completion and acceptance of the work shall be removed from the site of the work.

1.1.1 No Separate Payment. Payment for materials and equipment furnished under this section will not be paid for separately, and all costs in connection therewith shall be included in other items for which payment is provided.

1.2 APPLICABLE PUBLICATIONS. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

1.2.1 Engineering Manuals (EM).

EM 385-1-1	U.S. Army Corps of Engineers Safety and Health Requirements Manual

1.2.2 Engineering Pamphlets (EP).

EP 310-1-6A	U.S. Army Corps of Engineers Sign Standards Manual, VOL 1, CH 1

PART 2 PRODUCTS

2.1 TEMPORARY PROJECT AND SAFETY SIGNS. The Contractor shall furnish and erect one temporary project sign and one safety sign at the project site at the location designated by the Contracting Officer. The signs shall conform to the requirements of U.S. Army Corps of Engineers Sign Standard Manual EP-310.1-6a, Section 16 entitled, "Construction Project Signs", Pages 16.1 through 16.4, copies of which are enclosed at the end of this section. If sign is to be placed on a floating plant can be half sized. Information will be furnished by the Contracting Officer as to the location and wording of the signs.

2.2 TEMPORARY PROJECT SAFETY FENCING. The Contractor shall furnish and erect temporary project safety fencing as required by the Safety and Health Requirements Manual EM 385-1-1. The safety fencing shall be a high visibility orange color, HDPE open-weave pattern, a minimum of 42 inches high, supported and tightly secured to steel posts located on maximum 10 foot centers, constructed at the approved location. Fencing shall meet EPA's recommended recovered materials content levels of 60-100% for Postconsumer Content and 90-100% Total Recovered Materials Content.

PART 3 EXECUTION

3.1 CLEANUP. Construction debris, waste materials, packaging material

and the like shall be removed from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways shall be cleaned away.

3.2 RESTORATION OF STORAGE AREA. Upon completion of the project, areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition.

-END OF SECTION 01500-

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The use of signs to identify Corps managed or supervised design, construction, and rehabilitation projects—both for military and civil works is an important part of efforts to keep the public informed of Corps work. For this purpose, a construction project sign package has been adopted. This package consists of two signs; one for project identification and the other to show on-the-job safety performance of the contractor.

These two signs are to be displayed side by side and mounted for reading by passing viewers. Exact placement location will be designated by the contracting officer.

The panel sizes and graphic formats have been standardized for visual consistency throughout all Corps operations.

Panels are fabricated using HDO plywood with dimensional lumber uprights and bracing. The sign faces are non-reflective vinyl.

All legend sare to be die-cut or computer-cut in the sizes and typefaces specified and applied to the white panel backgorund following the graphic formats shown on pages 16.2-3. The Communications Red panel on the left side of the construction project sign with Corps signature (reverse version) is screen printed onto the white background.

A display of these two signs is shown on the following two pages. Mounting and fabrication details are provided on page 16.4.

Special applications or situations not covered in these guidelines should be referred to the District/Division sign coordinator.

Below are two samples of the construction project identification sign showing how this panel is adaptable for use to identify either military (top), or civil works projects (bottom). The graphic format for this 4' x 6' sign panel follows the legend guidelines and layout as specified below. The large 4' x 4' section of the panel on the right is to be white with black legend. The 2' x 4' section of the sign on the left with the full Corps signature (reverse version) is to be screen printed Communications Red on the white background.

This sign is to be placed with the Safety Performance Sign shown on the following page. Mounting and fabrication details are provided on page 16.4.

Special applications or situations not covered in these guidelines should referred to the District/Division sign coordinator.

Legend Group 1: One- to two-line description of Corps relationship to project.
Color: White
Typeface: 1.25" Helvetica Regular
Maximum line length: 19"

Legend Group 2: Division or District Name (optional). Placed below 10.5" Reverse Signature (6" Castle).
Color: White
Typeface: 1.25" Helvetica Regular

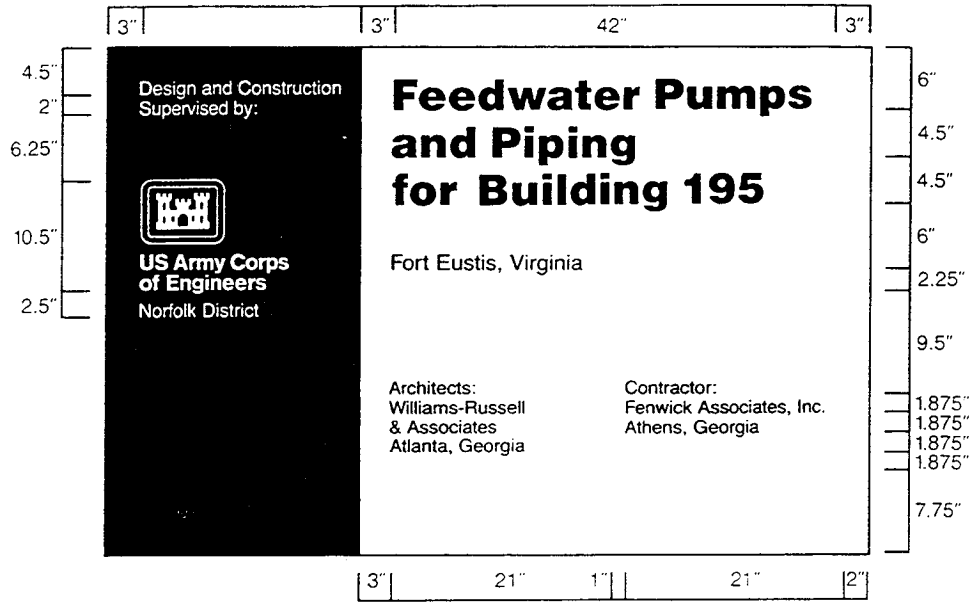
Legend Group 3: One- to three-line project title legend describes the work being done under this contract.
Color: Black
Typeface: 3" Helvetica Bold
Maximum line length: 42"

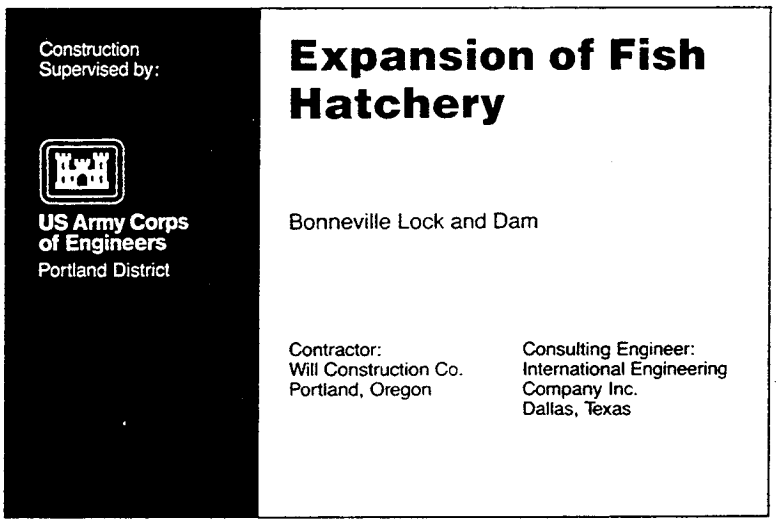
Legend Group 4: One- to two-line identification of project or facility (civil works) or name of sponsoring department (military).
Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

Cross-align the first line of Legend Group 4 with the first line of the Corps Signature (US Army Corps) as shown.

Legend Groups 5a-b: One- to five-line identification of prime contractors including: type (architect, general contractor, etc.), corporate or firm name, city, state. Use of Legend Group 5 is optional.
Color: Black
Typeface: 1.25" Helvetica Regular
Maximum line length: 21"

All typography is flush left and rag right, upper and lower case with initial capitals only as shown. Letter- and word-spacing to follow Corps standards as specified in Appendix D.





Sign Type	Legend Size	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-01	various	4" x 6"	4" x 4"	HDO-3	48"	WH-RD/BK

Each contractor's safety record is to be posted on Corps managed or supervised construction projectgs and mounted with the construction project identification sign specified on page 16.2.

The graphic format, color, size and typefaces used on the sign are to be reproduced exactly as specified below. The title with First Aid logo in the top section of the sign, and the performance record captions are standard for all signs of this type. Legend Groups 2 and 3 below identify the project and the contractor and are to be placed on the sign as shown.

Safety record numbers are mounted on individual metal plates and are screw-mounted to the background to allow for daily revisions to posted safety performance record.

Special applications or situations not covered in these guidelines should be referred to the District/Division sign coordinator.

Legend Group 1: Standard two-line title "Safety is a Job Requirement", with (8" od.) Safety Green First Aid logo. Color: To match PMS 347
Typeface: 3" Helvetica Bold
Color: Black

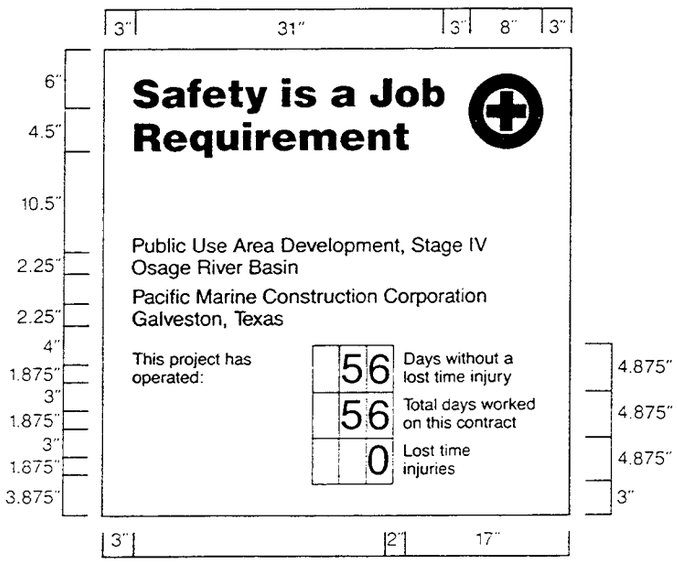
Legend Group 2: One- to two-line project title legend describes the work being done under this contract and name of host project.
Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

Legend Group 3: One- to two-line identification: name of prime contractor and city, state address.
Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

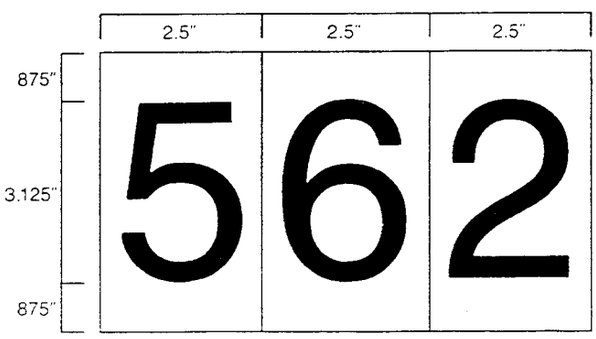
Legend Group 4: Standard safety record captions as shown.
Color: Black
Typeface: 1.25" Helvetica Regular

Replaceable numbers are to be mounted on white .060 aluminum plates and screw-mounted to background.
Color: Black
Typeface: 3" Helvetica Regular
Plate size: 2.5" x .5"

All typography is flush left and rag right, upper and lower case with initial capitals only as shown. Letter- and word-spacing to follow Corps standards as specified in Appendix D.



Sign Type	Legend Size	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-02	various	4" x 4"	4" x 4"	HDO-3	48"	WH/BK-GR



All Construction Project Identification signs and Safety Performance signs are to be fabricated and installed as described below. The signs are to be erected at a location designated by the contracting officer and shall conform to the size, format, and typographic standards shown on pages 16.2-3. Detailed specifications for HDO plywood panel preparation are provided in Appendix B.

Shown below the mounting diagram is a panel layout grid with spaces provided for project information. Photocopy this page and use as a worksheet when preparing sign legend orders.

For additional information on the proper method to prepare sign panel graphics, contact the District sign coordinator.

The sign panels are to be fabricated from .75" High Density Overlay Plywood. Panel preparation to follow HDO specifications provided in Appendix B.

Sign graphics to be prepared on a white non-reflective vinyl film with positionable adhesive backing.

All graphics except for the Communications Red background with Corps signature on the project sign are to be die-cut or computer-cut non-reflective vinyl, pre-spaced legends prepared in the sizes and typefaces specified and applied to the background panel following the graphic formats shown on pages 16.2-3.

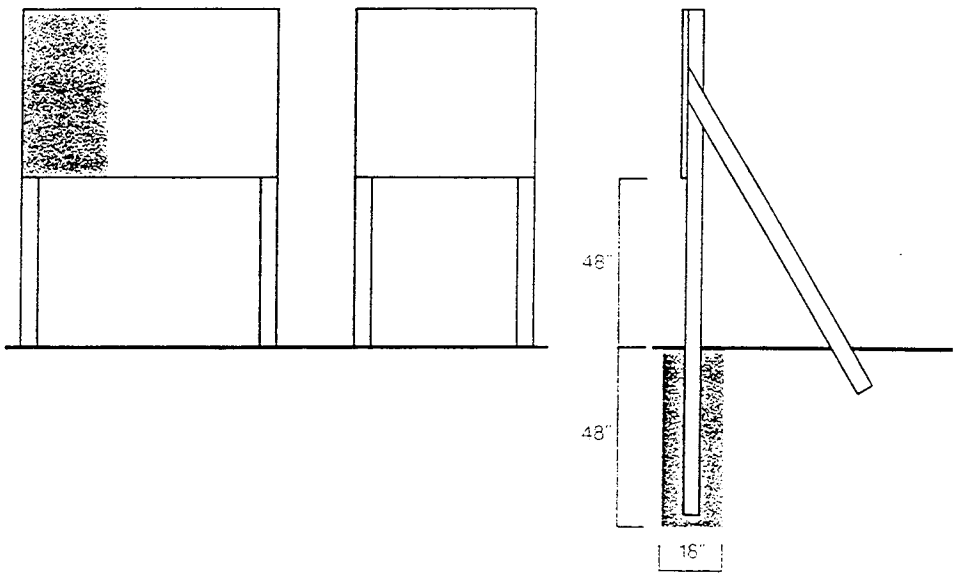
The 2' x 4' Communications Red panel (to match PMS-032) with full Corps signature (reverse version) is to be screen printed on the white background. Identification of the District or Division may be applied under the signature with white cut vinyl letters prepared to Corps standards. Large scale reproduction artwork for the signature is provided on page 4.8 (photographically enlarge from 6.875" to 10.5").

Drill and insert six (6) .375" T-nuts from the front face of the HDO sign panel. Position holes as shown. Flange of T-nut to be flush with sign face.

Apply graphic panel to prepared HDO plywood panel following manufacturers' instructions.

Sign uprights to be structural grade 4" x 4" treated Douglas Fir or Southern Yellow Pine, No.1 or better. Post to be 12' long. Drill six (6) .375" mounting holes in uprights to align with T-nuts in sign panel. Countersink (.5") back of hole to accept socket head cap screw (4" x .375").

Assemble sign panel and uprights. Imbed assembled sign panel and uprights in 4' hole. Local soil conditions and/or wind loading may require bolting additional 2" x 4" struts on inside face of uprights to reinforce installation as shown.



Construction Project Sign
Legend Group 1: Corps Relationship

1. _____
2. _____

Legend Group 2: Division/District Name

1. _____
2. _____

Legend Group 3: Project Title

1. _____
2. _____
3. _____

Legend Group 4: Facility Name

1. _____
2. _____

Legend Group 5a: Contractor/A&E

1. _____
2. _____
3. _____
4. _____
5. _____

Legend Group 5b: Contractor/A&E

1. _____
2. _____
3. _____
4. _____
5. _____

Safety Performance Sign
Legend Group 1: Project Title

1. _____
2. _____

Legend Group 2: Contractor/A&E

1. _____
2. _____

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SECTION 02070 - REMOVALS

PART 1 GENERAL

1.1 DESCRIPTION. The work covered in this section consists of furnishing all plant, labor, equipment, and performing all operations necessary for removal of the existing features as specified for the abandonment and removal of one existing relief well, RW-6. The Contractor shall remove and dispose of the pump house enclosure, slabs, foundation, pumps, piping, pump controls, electrical switch gear, and wiring for relief well RW-6. The Contractor shall completely fill relief well RW-6 with concrete.

1.2 QUALITY CONTROL.

1.2.1 General. The Contractor shall establish and maintain quality control for all operations to assure compliance with contract requirements and maintain records of its quality control for all construction operations, including but not limited to the following: removal of the pump house enclosure, pumping system, upper relief well structure, excavations, backfills, and disposal.

1.2.2 Reporting. A copy of these records, as well as the records of corrective action taken, shall be furnished to the Government daily.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 REMOVAL OF EXISTING FEATURES. The Contractor shall perform all operations necessary to abandon and remove from service one existing relief well, RW-6. The Contractor shall remove the pump house enclosure, slab, foundation, pump, all associated piping, pump controls, electrical switch gear, and wiring for the irrigation system installed in relief well RW-6. The Contractor shall completely fill relief well RW-6 with concrete up to within three feet of the ground surface in accordance with paragraph 02715-3.7. The Contractor shall remove the relief well riser pipes to depths no less than three feet below the ground surface. Removals that create excavations, holes, depressions, and all other types of voids below the lines and grades shown on the drawings shall be backfilled in accordance with paragraph 02200-3.3.

3.2 DISPOSAL. Pump house enclosure, pump, piping, pump controls, electrical switch gear, and wiring for relief well RW-6 shall be disposed of within the construction limits as directed by the Contracting Officer. Pump house slab, foundation, and relief well riser pipe that were removed shall be disposed off site in accordance with all applicable Federal, State, and local regulations.

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SECTION 02110
STRIPPING OPERATIONS

PART 1 GENERAL

1.1 SCOPE. The work covered by this section consists of furnishing all plant, labor, equipment, and materials, and performing all operations necessary for stripping, disposal of all stripped materials, and removal and disposal of debris.

1.2 SUBMITTALS. Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted to the Contracting Officer in accordance with SECTION 01300 - SUBMITTAL PROCEDURES.

1.2.1 Certificates. FIO. Submit written evidence that permission for disposal of material on the owner's private property has been obtained from the property owner. The written evidence shall consist of an authenticated copy of the conveyance under which the Contractor acquired the property rights and access thereto, prepared and executed in accordance with the laws of the State in which the material is to be disposed.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 STRIPPING. Stripping shall consist of the removal of all vegetation down to a depth of 6 inches from all areas where excavations are to be made. Vegetation stripping shall include the removal of material such as sod, grass, roots, and decayed vegetable matter. The products of the vegetation stripping shall be stockpiled inside of the construction limits and in an area approved by the Contracting Officer. Excess stripping materials shall be disposed of on site as directed by the contracting Officer.

3.2 DISPOSAL OF MATERIAL. The stripped materials shall be utilized as the upper 6-inches of the topsoil layer to be placed over areas where the relief well collector system was constructed. The stripped materials shall be stockpiled in the disposal areas as shown on the drawings and designated by the Contracting Officer. The Contractor shall not remove any stripped materials from the work site. Burning will not be allowed on this contract.

3.3 REMOVAL OF DEBRIS. The Contractor shall remove all debris and rubbish consisting of, but not be limited to, glass, plastic, wood, cloth, paper, concrete rubble, metal, brick, rubber, etc. from within the construction limits and shall dispose of such debris and rubbish in accordance with SECTION 01130 – ENVIRONMENTAL PROTECTION.

-END OF SECTION 02110-

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SECTION 02140 - CARE OF WATER

PART 1 GENERAL

1.1 SCOPE. The work provided for herein consists of furnishing all plant, labor, material, and equipment and performing all operations required for designing, furnishing, installing, testing, operating, maintaining and removing a system to unwater, dewater, and control surface water within the construction limits.

1.2 QUALITY CONTROL.

1.2.1 General. The Contractor shall establish and maintain quality control for the work specified in this section to assure compliance with contract requirements and maintain records of quality control for all construction operations, including but not limited to the following:

(l) Unwatering, Dewatering and Surface Water Removal. Design, submittal of plan, installation, adequacy, operation, maintenance and removal of subsurface and surface water control systems.

1.2.2 Reporting. A copy of these records and tests, as well as the records of corrective action taken, shall be furnished to the Government daily.

1.3 SUBMITTALS. Government approval is required for all submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with SECTION 01300 SUBMITTAL PROCEDURES:

1.3.1 Statements. Care of Water Plan; GA. Submit complete details of proposed subsurface and surface water removal plan within 15 days following Notice to Proceed.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL. All work shall be performed in the dry (free of water) conditions to construct the relief well collector and outflow system. The work for the construction of relief well manholes and collector system includes but not be limited to: excavation, placement of pipe bedding material, reinforced concrete manhole installation, reinforced concrete pipe (RCP) installation, pipe backfill, and collector system backfill under this contract except as otherwise specified. The care of water shall be accomplished by sequencing the construction, grading the areas around the excavation limits with swales, trenching, damming, storm drain diversion, cofferdams ,and other necessary installations to prevent ditch flows, including drainage from the existing drainage culvert, and surface water runoff from flowing into the excavations and pipe installation work areas. The Contractor shall be responsible for protecting the work areas from existing ditch flows and surface water up to elevation 410.0 feet NGVD.

3.2 UNWATERING, DEWATERING AND SURFACE WATER CONTROL. The Contractor

shall provide and operate a system(s) that consists of either one or a combination of the following but not be limited to: pumps, sumps, suction and discharge lines to remove surface water from within the excavations due to rainwater, surface drainage, and seepage. The Contractor shall control groundwater seepage, seepage through any embankment, upward seepage from the bottom of the excavations, and seepage through any cofferdam embankment. The Contractor shall control the piezometric surface(s) such that it remains below the bottom of the pipes, manholes, and associated backfills.

3.3 FLOODING WITHIN EXCAVATIONS. The Contractor shall suspend construction if the water within the excavations is higher than the bottom of the uncompleted collector system pipe and/or manhole construction. In the event of damage to portions of the completed permanent work caused by flooding, an equitable adjustment will be made to the contract price and duration as described in Special Clause 00800-6.

3.4 DISCHARGE. Flows from the dewatering and surface water control systems shall be discharged into the existing ditch system through the existing manhole at Station 0+00 when the Mississippi River levels are at or below 30.0 feet on the St. Louis Gage. This discharge shall not erode, scour or otherwise damage any completed work or existing ditch slope. When the Mississippi River levels are between 18.0 feet and 22.0 feet on the St. Louis Gage, the Contractor shall pump the flows from the dewatering and surface water control systems over the levee. The Contractor shall protect the levee embankment, berm and foreshore from being eroded from the pump discharge.

3.5 CARE OF WATER PLAN. Before starting installation of any care of water plan, the Contractor shall prepare and submit to the Contracting Officer a detailed plan, including equipment and materials to be used and the sequence of operation for care of water. The Contractor's plan shall include complete details of proposed cofferdam dewatering and surface water control, including but not necessarily limited to all cofferdams, flumes, sumps, sump pumps, ditches or other work necessary to keep the work areas drained. The Contractor Officer's review of the proposed plan will not relieve the Contractor of its responsibility to provide a plan adequate to accomplish the desired results.

3.6 MAINTENANCE AND SERVICING. The Contractor shall be responsible for the maintenance, servicing, and repairs of the entire dewatering and surface water control system during the life of the contract. Maintenance, servicing, and repair operations are not cause for relaxation of the specified dewatering or surface water control requirements, and the system shall be designed to provide the specified conditions during maintenance, servicing and repair.

3.7 EXISTING OPERATION OF INTERIOR DRAINAGE FACILITIES. When the Mississippi River stage at St. Louis is below a stage of 18.0 feet, gravity conditions for interior drainage exist. All interior drainage flows south in the Chain of Rocks ditch through a 48-inch gated corrugated metal pipe (CMP) gravity outlet, GW-5, into the Chain of Rocks Canal downstream of Locks No. 27. The Contractor should duly note that in the event of locally heavy rains the channel is subject to rapid rise and localized flooding in adjacent areas. If the Mississippi River stage is at or above 18 feet on the St. Louis Gage, the gravity drain outlet, GW-5, in the Melvin Price Support Center is closed to prevent Mississippi River backwater from entering the interior and the gravity drain gatewell, GW-4, at 20th Street is closed to prevent runoff from entering the golf course from the area upstream of 20th Street.

3.8 Control of Water Within the Excavations. The Contractor shall keep all excavations free of water at the Contractor's own expense. The Contractor shall provide all dams, flumes, channels, sumps, or other works necessary to keep the excavation entirely clear of water and shall provide and operate pumps or other suitable equipment of adequate capacity for sumping out the excavations. The Contractor shall avoid producing mud in the trench or channel bottom by construction operations. Soil which becomes soft as a result of improper drainage shall be removed and replaced with pervious material at the Contractor's own expense to maintain a firm dry excavation bottom and base. Pipe bedding, laying, jointing, and the placing of concrete or masonry shall be accomplished in a water-free trench or excavation, which shall be kept clear of water until pipe joints, concrete and masonry have set and are resistant to water damage. The water shall be disposed of in a manner approved by the Contracting Officer.

-END OF SECTION-

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SECTION 02200 - EARTHWORK

PART 1 - GENERAL

1.1 SCOPE. The work covered by this section includes furnishing all labor, equipment, supplies, materials, and performing all operations necessary for earthwork including excavating, trenching, filling, and backfilling for relief wells and collector system construction and their appurtenances. This is to include but is not limited to: relief well concrete pads, manholes, relief well discharge collector system, and drainage pipes as indicated on the drawings and as specified herein.

1.2 APPLICABLE PUBLICATIONS. All publications referenced shall be the most current edition unless otherwise stated. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1.2.1 American Society for Testing and Materials (ASTM).

ASTM D 2487 Classification of Soils for Engineering Purposes

1.2.2 Illinois Department Of Transportation (IDOT).

Standard Specifications for Road and Bridge Construction (Adopted January 1, 1997)

1.2.3 U. S. Army Corps of Engineers Manual (EM).

EM 385-1-1 Safety and Health Requirements Manual, (Sep 1996)

1.3 DEFINITIONS.

1.3.1 Complete Passes During Compaction Operations. A complete pass during the compaction operations is defined herein. The Contractor shall operate the compaction equipment over the entire area to be compacted so that the equipment imparts energy into all the material within that area to be compacted. The components on the compaction equipment such as the supporting wheels and tires which only pass over the material and do not impart the required compaction effort will not be counted toward the required number of complete passes for that material layer.

1.3.2 Soil Material Types and Classifications. Soil material types and classifications are defined in ASTM D 2487 and shall be used accordingly.

1.4 SUBMITTALS. Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted to the Contracting Officer in accordance with SECTION 01300 - SUBMITTAL PROCEDURES.

1.4.1 Reports. Placement and Compaction Certification; FIO. Submit reports certifying that the placement and compaction of the fills and

backfills conform to the requirements specified in SECTION 02200 - EARTHWORK within 24 hours of the work being performed. The Placement and Compaction Certifications shall document that the required backfill materials and compaction efforts were performed in accordance with the requirements specified herein. The Contractor shall document and certify the station limits of work performed that day, elevations of the different backfill materials, backfill materials compacted, type of compaction equipment, layer thickness, and number of complete compaction passes per layer.

1.4.2 Plan. Excavation Plan; GA. An excavation plan identifying the method, equipment, and sequence of work for the excavations shall be submitted by the Contractor for government approval. Excavations that are required to construct the contract features include but are not limited to: relief well manholes, laterals, collector pipe, and collector pipe manholes. The excavation plan shall be submitted and approved by the Contracting Officer prior to commencing any earthwork.

1.4.3 Plan. Shoring and Trenching Plan; GA. The lower eight (8) feet of the trench excavations for the construction of the collector pipe shall be made vertical and supported with shoring and/or trench shields and of such width as recommended in the manufactures installation manual for the features of work listed above. The sloped excavations above the top of the mandatory shoring and trench shields shall be sloped no steeper than 1 vertical on 1.5 horizontal. The shoring and trenching plan shall be submitted by the Contractor in accordance with EM 385-1-1, Safety and Health Requirements Manual. The shoring and trenching plan shall be prepared, signed, and sealed by a professional engineer, who is registered in the state of Illinois. All submitted analyses, calculations, designs, and plans shall be signed and sealed by the responsible professional engineer. The shoring and trenching plan shall be submitted a minimum of 30 days in advance prior to initiating work on the manholes and collector pipes for the approval by the Contracting Officer.

1.4.4 Plan. Fill and Backfill Plan; GA. The Contractor shall submit for review and approval by the Contracting Officer a minimum of 30 days prior to filling and backfilling, the plan of operations for accomplishing all fills and backfills as specified herein. The plan shall address the construction of the relief well manholes, laterals, collector pipe and collector manholes. The plan shall contain, as a minimum but not limited to, the following:

(1) The Contractor's proposed list of equipment types of each equipment type to be utilized for all fill and backfill operations.

(2) The Contractor's proposed methods for placing and compacting the fills and backfills.

(3) The Contractor's proposed methods for providing drainage prior to, during, and after placement of partially and completed fills and backfills. The Contractor shall include the method of smoothing and sealing the fills and backfills at the end of each work period to minimize the material's absorption of unneeded moisture from precipitation and runoff.

1.4.5 Statements. Gradation; FIO. Submit statement and certifying that the gradations for coarse aggregate (CA 7) material and fine aggregate (FA 1) material conform to the specified requirements.

1.5 QUALITY CONTROL. The contractor shall establish and maintain quality control for all operations to assure compliance with contract requirements and maintain records of its quality control for all construction operations, including but not limited to the following:

a. Excavation and trenching for relief wells and collector system construction.

b. Foundation preparation of all excavated and trenched areas.

c. Fill and backfill placement and compaction certification.

1.6 PERMITS. In accordance with the Contract Clause PERMITS AND RESPONSIBILITIES, the Contractor shall obtain all necessary permits required for disposal, hauling, erosion control, and pay all fees associated with permitting and compliance. In addition, the Government has obtained permits for storm water discharge (NPDES). These permits are discussed in SECTION 01130 - ENVIRONMENTAL PROTECTION. The Contractor shall comply with the terms of these permits and with the requirements of SECTION 01130 and this section.

1.7 PROTECTION OF CULTURAL AND NATURAL RESOURCES. All work and Contractor operations shall comply with the requirements of SECTION 01130 and with the requirements of this section.

1.8 PROTECTION OF EXISTING MANMADE FACILITIES AND NATURAL FEATURES. Excavation shall be conducted in such a manner as to avoid damage to trees left standing and trees outside the clearing and excavation area, existing buildings, manmade facilities and natural features, and with due regard to the safety of employees and others. Existing utility lines that are shown on the drawings or the locations of which are made known to the Contractor prior to excavation and that are to be retained shall be protected from damage during excavation.

1.9 SUBSURFACE DATA. Subsurface soil boring logs are shown on the drawings. This data represents the best subsurface information available; however, variations may exist in the subsurface between boring locations. The groundwater levels indicated in the soil boring logs were at the time of exploration. The groundwater table may vary significantly depending on the time of year and river stage level. Coarse grain soil gradation curves are available to be reviewed at the St. Louis District Office as specified in Special Clause 00800-3. Soil boring logs of those borings located outside this contract's construction limits are available to be reviewed at the St. Louis District Office as specified in Special Clause 00800-3.

PART 2 - PRODUCTS

2.1 SATISFACTORY FILL AND BACKFILL MATERIALS.

2.1.1 General. Satisfactory materials shall consist of materials classified in accordance with ASTM D 2487 as CL, CH, CL-ML, ML, SC, SM, SP, SW. The fills and backfills shall be constructed of satisfactory materials specified herein and obtained from the required excavations and commercial sources. Fill and backfill materials shall be free from unsuitable materials of as defined in paragraph 02200-2.3.

2.1.2 Pervious Materials. Pervious materials shall consist of any material classified by ASTM D 2487 as SP or SW. If there are insufficient quantities of pervious materials for backfill, the Contractor shall supply the pervious materials at no additional cost to the Government.

2.1.3 Impervious Materials. Impervious materials shall include materials classified by ASTM D 2487 as CL, CH, CL-ML, and ML. Contractor will sample the impervious material to be used for the work in the presence of a Government representative. The Contractor shall provide the samples to the Government for testing and verification.

2.1.4 Random Material. Random materials shall consist of materials classified in accordance with ASTM D 2487 as CL, CH, CL-ML, ML, SC, SM, and SP. These materials may have in-place water contents as excavated. Random materials shall be placed to the lines and grades as shown on the drawings.

2.1.5 Coarse Aggregate (CA 7) Material. Coarse aggregate (CA 7) material shall consist of **clean non-carbonate river gravels**. The coarse aggregate material shall be composed of tough, durable particles, and shall be reasonably free from thin, flat and elongated pieces, and shall contain no organic matter nor soft, friable particles in quantities considered objectionable by the Contracting Officer. Grading for IDOT CA 7 is in accordance with the following requirements:

Permissible Limits

U.S. Standard Sieve	Percent by Weight Passing
1½-inch	100
1-inch	90 - 100
½-inch	30 - 60
No. 4	0 – 10
No. 200	0

Coarse aggregate (CA 7) material shall be well-graded between the limits shown. All points on individual grading curves obtained from representative samples of coarse aggregate (CA 7) material shall lie between the boundary limits as defined by smooth curves drawn through the tabulated grading limits plotted on a mechanical analysis diagram. The individual grading curves within these limits shall not exhibit abrupt changes in slope denoting either skip grading or scalping of certain sizes or other irregularities that would be detrimental to the proper functioning of the coarse aggregate (CA 7) material layer. The Contractor shall supply a certificate from the supplier of the coarse aggregate (CA 7) material indicating that the material delivered to the job site is certified to meet the IDOT gradation CA 7 requirements.

2.1.6 Fine Aggregate (FA 1) Material. Fine aggregate (FA 1) material shall consist of **clean non-carbonate river sands**. The fine aggregate (FA 1) material shall be composed of tough, durable particles and shall contain no organic matter nor soft, friable particles in quantities considered objectionable by the Contracting Officer. Grading for IDOT FA 1 is in accordance with the following requirements:

Permissible Limits

U.S. Standard Sieve	Percent by Weight Passing
?-inch	100
No. 4	94 - 100
No. 16	45 - 85
No. 50	3 – 29
No. 100	0 - 10
No. 200	0

Fine aggregate (FA 1) material shall be well-graded between the limits shown. All points on individual grading curves obtained from representative samples of fine aggregate (FA 1) material shall lie between the boundary limits as defined by smooth curves drawn through the tabulated grading limits plotted on a mechanical analysis diagram. The individual grading curves within these limits shall not exhibit abrupt changes in slope denoting either skip grading or scalping of certain sizes or other irregularities that would be detrimental to the proper functioning of the fine aggregate material layer. The Contractor shall supply a certificate from the supplier of the fine aggregate material indicating that the material delivered to the job site is certified to meet the IDOT gradation FA 1 requirements.

2.2 TOPSOIL. Topsoil includes excavated materials obtained from the stripping operations that specified that the upper 6 inches of material be stripped below the ground surface. The stripped materials that contain organics and vegetation with roots and stems less than ½-inch diameter shall be placed as the finished ground surface material to promote rapid establish of turf. The remainder of the topsoil material not obtained from the stripping operations shall consist of impervious material as specified in paragraph 02200-2.1.3.

2.3 UNSUITABLE MATERIALS. Unsuitable materials include but not limited to roots and vegetation of ½-inch diameter and greater and other organic matter, trash, debris, and frozen materials. Foundation materials consisting of soft, wet, or organic material, debris, rubble, or any material over 3 inches in size in its maximum dimension shall be considered as unsuitable materials. In no case shall frozen materials be placed.

2.4 EARTHWORK EQUIPMENT.

2.4.1 General. The Contractor shall use tractor drawn or self-propelled compaction rollers to compact the impervious and random materials. Impervious and random backfills that are within 4.0 feet of the concrete, pipe, structure, and manhole shall be compacted with use of power tamping rammers. Fill and backfill materials shall be placed in accordance with paragraph 02200-3.3. Vibratory rollers and vibratory plate compactors shall be used to compact the pervious, coarse aggregate (CA 7) material, and fine aggregate (FA 1) material backfills. All rollers and compactors shall be field checked under the direction and supervision of the Contracting Officer prior to their use on the backfill to assure that they meet the specified requirements. Any equipment that does not meet the specified requirements will not be allowed on the fill or backfill. Water jetting for compaction is strictly prohibited.

2.4.2 Compaction Rollers. Compaction rollers shall consist of one or more units. Compaction rollers fitted with sheepsfoot tamping feet or tamping pads are allowed. Each unit shall consist of a cylindrical drum not less than 60 inches in length and not less than 60 inches in diameter. The drums shall be filled with ballast. Ballast may consist of water, sand, or other approved ballast. The weight of the roller when fully loaded shall not be less than 4000 pounds per linear foot of drum length and when empty shall not be less than 2500 pounds per linear foot of drum length. The Contractor shall be required to vary the amount of ballast in the drums to obtain optimum compaction effort for the material being compacted. The rolling units shall be equipped with a suitable device for cleaning the feet. The rolling units of multiple-type compaction rollers shall be pivoted on the main frame in a manner, which will permit the units to adapt themselves to uneven ground surfaces and to rotate independently. The roller speed shall not exceed 3.5 miles per hour.

2.4.3 Power Tamping Rammers. Power tamping rammers shall be used to compact backfills in areas that compaction rollers are not allowed. Power tamping rammers may be used to compact pervious, coarse aggregate (CA 7) material, and fine aggregate (FA 1) material, impervious material, and random material backfills. Power tamping rammers shall have a minimum impact force of 2,500 pounds per blow. The tamping (shoe) surface area shall be between 140 and 160 square inches.

2.4.4 Vibratory Rollers. Vibratory rollers shall be used to compact pervious, coarse aggregate material, and fine aggregate material backfills. The vibratory rollers shall be equipped with a smooth steel compaction drum or steel drum with pads. The level of amplitude and vibration frequency during compaction shall be maintained uniform throughout the fill zone within which it is operating. Vibratory rollers shall be operated at a frequency of vibration during compaction operations between 1,500 and 2,500 vibrations per minute (vpm). The vibratory rollers shall have a minimum centrifugal force of 15,000 pounds. Rollers shall be operated at speeds not to exceed 1.5 miles per hour.

2.4.5 Vibratory Plate Compactors. Vibratory plate compactors for compacting pervious, coarse aggregate material, and fine aggregate material backfills shall be equipped with a smooth steel plate. The level of amplitude and vibration frequency during compaction shall be maintained uniform throughout the fill zone within which it is operating. Vibratory plate compactors shall be operated at a frequency of vibration during compaction operations between 5,000 and 8,000 vibrations per minute (vpm). Vibratory plate compactors shall have a minimum centrifugal force of 3,500 pounds. The vibratory plate (shoe) surface area shall be between 400 and 525 square inches.

2.4.6 Spreading Equipment. Spreading equipment shall be capable of spreading and blending materials in horizontal layer thickness between 4.0 and 12.0 inches.

2.4.7 Sprinkling Equipment. Sprinkling equipment shall be designed to apply water uniformly and in controlled quantities to variable widths of surface. The water tank truck shall have a minimum capacity of 2000 gallons.

2.4.8 Pneumatic Backfill Tampers. Pneumatic backfill tampers shall used to compact fine aggregate (FA 1) material and random material backfills under pipe spring lines and haunches. The pneumatic backfill tamper shall

tamper impact rates between 600 and 800 blows per minute (bpm). The pneumatic backfill tamper shall a cylinder stroke distance between 5.0 and 8.5 inches and shall be fitted with a tamper impact surface diameter between 5.0 and 6.5 inches.

PART 3 - EXECUTION

3.1 EXCAVATION.

3.1.1 General. Excavation shall be performed to the lines, grades, and dimensions as indicated on the drawings. During the excavation, materials suitable for filling and backfilling shall be stockpiled. Grading shall be done as necessary to prevent surface water from flowing into the excavation, and any water accumulating therein shall be removed to maintain the stability of the bottom and sides of the excavation. Unauthorized over excavation shall be backfilled in accordance with the requirements specified in paragraph 02200-3.2, at no additional cost to the Government.

3.1.2 Trench Excavations.

3.1.2.1 General. Trenches shall be excavated to the lines, grades, and limits as shown on the drawings. Trenches shall be excavated and stabilized in accordance with EM 385-1-1, Safety and Health Requirements Manual.

3.1.2.2 Bottom Preparation. The bottoms of trenches shall be accurately graded to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Stones of 3 inches or greater in any dimension shall be removed to avoid point bearing on pipe and puncturing the nonwoven geotextile.

3.1.2.3 Control of Water. The Contractor shall keep all excavations free of water at the Contractor's own expense. The Contractor shall comply with all the requirements specified in SECTION 02140 - CARE OF WATER.

3.1.2.4 Removal of Unsuitable Material. Where unsuitable material is encountered in the bottom of the excavations, such material shall be removed to the depth directed by the Contracting Officer. The unsuitable material shall be replaced to the proper grade with pervious material as specified in paragraph 02200-3.2.

3.1.3 Excavations for Collector Pipes and Collector Manholes. Excavations for the collector pipes and collector manholes shall be excavated 24 inches below the bottom of the collector pipes and collector manholes as shown on the drawings. The bottom eight (8.0) feet of the trench wall excavations for the collector pipes shall be laterally supported with shoring or manufactured trench shields to provide protection for employees who may be exposed to moving ground or cave in. Trench excavations that will exceed eight (8.0) feet in total depth may be sloped back above the final elevation of the top of the shoring or trench shield. The upper excavation slopes shall conform to the requirements in EM 385-1-1, Safety and Health Requirements Manual. The excavations for the collector manholes are exempt from the mandatory shoring requirements.

3.1.4 Excavations Relief Well Manholes and Lateral Pipes. The excavations for the relief well manholes and lateral pipes are exempt from

the mandatory shoring requirements. Excavations for the relief well manholes and lateral pipes shall be excavated conforming to the requirements in EM 385-1-1, Safety and Health Requirements Manual and as shown on the drawings. Excavations for the relief well manholes shall be excavated to construct the cast-in-place relief well concrete pads as shown on the drawings. The relief well manholes and lateral pipes do not require the placement of the 24-inch thick coarse aggregate pipe bedding below the bottom of the relief well manholes and lateral pipes.

3.1.5 Excavation of Existing (EX-1) Manhole. The Contractor shall use extreme precaution when excavating around the existing (EX-1) manhole located at C1 Station 0+00 to construct the tie-in with the collector pipe system. The Contractor shall also excavate the area of subsidence that is located over the existing 48-inch corrugated metal pipe and portions of the 96-inch diameter precast concrete manhole and cover to complete the construction and repairs. Excavation of the existing backfill materials adhering onto the manhole and pipes shall be performed by using hand shovels to avoid damaging the existing manhole and pipes. The Contractor shall expose the existing 48-inch diameter corrugated metal pipe for a minimum length five feet from the existing manhole.

3.1.6 Temporary Stockpiles. Temporary stockpiles shall be kept neat with well-drained slopes, giving due consideration to drainage at all times. Stockpiles of satisfactory materials shall be protected from contamination, which may destroy the quality and fitness of the stockpiled material. If the Contractor fails to protect the stockpiles, and any material becomes unsuitable, such material shall be removed and replaced with satisfactory material from approved sources at no additional cost to the Government. The stockpile(s) shall be no more than 10 feet high with side slopes no steeper than 1 vertical on 2 horizontal. Stockpiles shall be placed in an orderly manner at a distance from the banks of the trench equal to the depth of the excavation plus 10 feet. The Contractor shall separate the material types during the excavations and shall place them into separate stockpiles. The excavated material from the stripping operation, excavated topsoil, and excavated impervious materials to be used to supplement the topsoil backfill requirements may be stockpiled together.

3.1.7 Disposal of Excess Materials. Excess materials shall be placed within disposal areas as shown on the drawings and designated by the Contracting Officer. The final side slopes shall be no steeper than 1 vertical on 5 horizontal or as directed by the Contracting Officer. All excess materials and disturbed areas shall be dressed smooth in preparation to the establishment of turf.

3.1.8 Disposal of Unsuitable Materials. The Contractor shall properly dispose of all unsuitable materials off site and at no additional cost to the Government.

3.2 FOUNDATION PREPARATION.

3.2.1 General. The foundation shall be prepared to the lines, grades, and dimensions as shown on the drawings.

3.2.2 Manholes and Pipes. Loose, unsuitable, and unstable materials shall be removed. Unstable materials will be determined in the field by the Contracting Officer. When concrete is to be placed in an excavated area, special care shall be taken not to disturb the bottom of the excavation.

3.2.3 Replacement of Unsuitable and Unstable Materials. Unsuitable and unstable materials that are removed from the bottom of the excavated areas shall be replaced with satisfactory pervious material placed in layers not exceeding 6 inches loose thickness. A minimum of 6 complete passes with vibratory compaction equipment shall be performed on replacement layers not to exceed 6 inches in loose thickness.

3.2.4 Preparation of Impervious Foundations. The Contractor shall prepare the bottom of the excavation consisting of impervious materials prior to constructing concrete manholes, reinforced concrete pipe, placing fills, and backfills. In preparing the foundations, the Contractor shall remove loose materials and replace unsuitable and unstable materials as specified in paragraph 02200-3.2.3. The Contractor shall complete the preparation by compacting the bottom of excavations consisting of impervious materials with compaction equipment meeting the requirements specified in paragraphs 02200-2.4.1, 02200-2.4.2, and 02200-2.4.3. A minimum of 6 complete passes shall be performed.

3.2.5 Preparation of Pervious Foundations. The Contractor shall prepare the bottom of the excavation consisting of pervious materials prior to constructing concrete manholes, reinforced concrete pipe, fills, and backfills. In preparing the foundations, the Contractor shall remove loose materials and replace unsuitable and unstable materials as specified in paragraph 02200-3.2.3. The Contractor shall complete the preparation by compacting the bottom of excavations consisting of pervious material with vibratory compactors meeting the requirements specified in paragraphs 02200-2.4.1, 02200-2.4.4, and 02200-2.4.5. A minimum of 6 complete passes shall be performed.

3.3 PLACEMENT AND COMPACTION OF FILLS AND BACKFILLS.

3.3.1 General. Fills and backfills shall be to the lines, grades, and dimensions shown on the drawings. The topsoil material shall be placed with a minimum of 12 inches in place thickness and compacted as specified below in paragraph 02200-3.3.6 and as shown on the drawings. If not indicated on the drawings, the Contractor shall match the finished backfill surfaces with the existing adjacent lines and grades.

3.3.2 Backfill of Collector Pipes and Collector Manholes. Once the foundation has been prepared, the Contractor shall place the nonwoven geotextile into the bottom of the excavation prior to placing the coarse aggregate (CA 7) material. The Contractor shall place and compact at least 24 inches deep of coarse aggregate (CA 7) material within the geotextile-lined trench as pipe bedding for the collector pipes and collector manholes as shown on the drawings. The coarse aggregate (CA 7) material shall be placed in 12-inch maximum layers and each layer shall be compacted with at least 6 passes with vibratory plate compactors and vibratory rollers that meet or exceed the requirements specified in paragraph 02200-2.4. Upon completion of the placement of the collector pipes and collector manholes and in accordance with SECTION 02720 – RELIEF WELL COLLECTOR SYSTEM, the Contractor shall place and compact fine aggregate (FA 1) material under, around, and over the collector pipes. The fine aggregate (FA 1) material shall conform to the requirements as specified in paragraph 02200-2.1. The fine aggregate (FA 1) material shall surround the collector pipe on both sides and up to 2.0 feet above the top of the collector pipe as shown on the drawings. The Contractor shall maintain the collector pipes at their proper

location, lines and grades within a tolerance of 1.0-inch in all directions. The fine aggregate (FA 1) material layer thickness shall not exceed 4.0 inches in loose thickness when hand-operated vibratory plate compactors and power tamping rammers are used for compaction. Where hand-operated vibratory plate compactors and power tamping rammer equipment cannot compact the backfill material under the pipes, pneumatic backfill tampers shall be used to tightly compact the backfill material under the pipe spring lines and haunches. The pneumatic backfill tampers shall conform to the requirements specified in paragraph 02200-2.4.8. Random fill as specified in 02200-2.1 shall be used as backfill above the fine aggregate (FA 1) material up to within 12 inches of the final ground surface. All fine aggregate (FA 1) material and random material used as backfill shall be brought up evenly on all sides of the collector pipes and collector manholes so that no unbalanced lateral loading acts on the structures. Backfills shall be placed and spread evenly in horizontal layers not to exceed 4 inches in loose thickness when being compacted by hand-operated vibratory plate compactors specified in paragraph 02200-2.4.5. Backfills placed more than 2 feet away from pipes and manholes shall be spread evenly in horizontal layers not to exceed 6 inches in loose thickness except when compacted with hand-operated compaction equipment. When compaction rollers that conform to paragraph 02200-2.4.2 are used, the maximum loose layer thickness shall not exceed 8 inches. A minimum of 6 complete passes per layer shall be performed with approved compaction equipment conforming to paragraph 02200-2.4.

3.3.3 Displacement Collector Pipes. When the collector pipe backfills are between 12 and 24 inches above the top of the collector pipes, the pipes shall be inspected to determine whether significant displacement has occurred. This inspection shall be conducted in the presence of the Contracting Officer. The pipe shall be inspected by shining a laser between manholes and the far end of the pipe. If, in the judgment of the Contracting Officer, the interior of the pipe shows poor alignment of more than 1.0 inches off centerline or any other defects that would cause improper functioning of the system, the defects shall be remedied as directed at no additional cost to the Government.

3.3.4 Relief Well Manhole and Lateral Pipe Backfills. Random material shall be used as backfill for the relief well manholes and lateral pipes. Backfill materials shall be brought up evenly on all sides of the relief well manholes and lateral pipes so that no unbalanced lateral loading acts on the structures. The random material layer shall not exceed 4.0 inches in loose thickness when hand-operated power tamping rammers are used for compaction. Where power tamping rammer equipment cannot compact the backfill material under the pipes, pneumatic backfill tampers shall be used to tightly compact the backfill material under the pipe spring lines and pipe haunches. The pneumatic backfill tampers shall conform to the requirements specified in paragraph 02200-2.4.8. The random material to be placed 2 feet above the top and away from the lateral pipes shall be spread evenly in horizontal layers not to exceed 6 inches in loose thickness. The Contractor shall compact each random material layer with a minimum of 6 complete passes per layer with the appropriate type of compaction equipment for the soils being compacted. The compaction equipment shall conform the requirements specified in 02200-2.4. When the Contractor uses hand-operated power tamping rammers specified in paragraph 02200-2.4.3 to compact fills and backfills, the Contractor shall reduce the maximum layer thickness to 4 inches of loose material. The Contractor shall match the finished backfill surfaces with the existing adjacent lines and grades. When compaction rollers that conform to paragraph 02200-2.4.2 are used, the maximum loose layer thickness shall not exceed 8

inches. A minimum of 6 complete passes per layer shall be performed with approved compaction equipment conforming to paragraph 02200-2.4.

3.3.5 Topsoil Replacement. The topsoil shall be replaced with a final in-place minimum thickness of 12 inches. The layers shall be compacted by 2 passes with a tracked dozer or equal. The topsoil finished grades shall match the lines and grades of the adjacent existing surfaces. Upon replacing the topsoil, all disturbed areas shall be dressed smooth and rolled with a smooth drum roller for the establishment of turf by others.

3.4 GRADE TOLERANCES. The location, grades, and dimensions shall conform to the applicable cross sections on the drawings unless otherwise specified. A tolerance of two-tenths of one foot above the prescribed grade and cross section shown will be permitted in the final dressing. The above tolerance will be permitted provided that there are no abrupt humps or depressions in surfaces.

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Chain of Rocks Golf Course
Section 02715 - Relief Wells
Table 1

Relief Well No.	Surface El.	Flow El.	Northing	Easting	Drilling Depth	Riser Length	Blank Depths	Screen Length
	(feet)	(feet)	IL WEST NAD 83		(feet)	(linear feet)	(linear feet)	(linear feet)
RW-214	413.61	405.25	739576.79	2292887.12	70	20	--	40
RW-215	415.33	405.47	739664.79	2292766.12	70	19	--	40
RW-216	416.43	405.68	739752.64	2292643.13	70	17	--	40
RW-217	418.13	405.85	739871.54	2292630.70	70	16	--	40
RW-218	418.64	406.03	739981.63	2292688.69	71	12	--	45
RW-219	419.20	406.21	740094.36	2292744.36	73	14	--	45
RW-220	418.06	406.43	740227.62	2292814.66	57	13	--	30
RW-221	416.52	406.71	740406.32	2292904.34	57	15	--	30
RW-222*	415.28	407.00	740582.63	2292993.40	62	13	--	35
Total					**600**	**139**		**345**
*RW 222--15-foot of the screen should be in 5-foot increments to allow for field design of the well.								
CONTRACTOR SHALL FIELD VERIFY ALL ELEVATIONS AND DEPTHS								

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INDEX

DIVISION 2 - SITE WORK

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SECTION 02720
RELIEF WELL COLLECTOR SYSTEM

PART 1 - GENERAL

1.1 SCOPE. The work covered by this section consists of furnishing all material, supplies, equipment, and performing all labor for the design, manufacture, care, handling, transportation, placement, and proper installation of the relief well collection system and its structural components are specified herein. The relief well collector system includes but is not limited to: relief well manholes, reinforced concrete pipes, and collector manholes for the collector system that shall be constructed as specified herein and as shown on the drawings. An existing manhole and pipes shall be repaired as part of this contract work.

1.2 APPLICABLE PUBLICATIONS. All referenced publications shall be the most current version, edition, standard, latest revision, or reapproval unless otherwise stated. The publications and standards listed below will be referred to only by the basic designation, and shall form a part of this specification to the extent indicated by the references thereto:

1.2.1 American Society for Testing and Materials (ASTM).

ASTM A 48	Gray Iron Castings
ASTM A 126	Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A 312	Seamless and Welded Austenitic Stainless Steel Pipes
ASTM A 536	Ductile Iron Castings
ASTM B 98	Copper-Silicon Alloy Rod, Bar, and Shapes
ASTM B 584	Copper Alloy Sand Castings for General Applications
ASTM C 76	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C 270	Mortar for Unit Masonry
ASTM C 443	Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
ASTM C 478	Precast Reinforced Concrete Manhole Sections
ASTM C 990	Joints for Concrete pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants

1.2.3 American Association of State Highway and Transportation Officials (AASHTO).

AASHTO M-198 B Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets

1.2.4 American Concrete Pipe Association (ACPI). "Concrete pipe Design Manual", Thirteenth Printing (Revised) June, 2000.

1.2.5 U. S. Army Corps of Engineers Manual (EM).

EM 385-1-1 Safety and Health Requirements Manual, (Sep 1996)

1.3 SUBMITTALS. Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted to the Contracting Officer in accordance with SECTION 01300 SUBMITTAL PROCEDURES:

1.3.1 Instructions. Placing Pipe and Alignment Plan; "GA". Printed copies of the manufacturer's recommendations for installation procedures of the material being placed, shall be furnished prior to installation. This also includes submitting a plan drawing of pipe layout and documentation by manufacturer verifying joints have the proper deflection for the curved alignment, if needed, shown on the drawings or the use of beveled pipe where deflections cannot be met.

1.3.2 Pipe Certificates. Pipe Certification; "GA". Certified copies of test reports and structural designs demonstrating conformance to applicable pipe component specifications, before the pipes are installed.

1.3.3 Manhole Certificates. Manhole Certification; "GA". Certified copies of test reports and structural designs demonstrating conformance to applicable manhole component specifications, before manholes are installed.

1.3.4 Preformed Flexible Joint Sealants; "GA". Submits manufacturer's literature certifying compliance with specifications.

1.4 DELIVERY, STORAGE, AND HANDLING.

1.4.1 Delivery and Storage. Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. Gasket materials and plastic materials shall be protected from exposure to the direct sunlight over extended periods.

1.4.2 Handling. Materials shall be handled in such a manner as to ensure delivery to the work site in sound, undamaged condition. Pipe shall be carried to the trench excavation, not dragged.

PART 2 - PRODUCTS

2.1 MANHOLES.

2.1.1 Relief Well Manholes. The relief well manholes shall conform to the lines, grades, and dimensions as shown on the drawings. The top elevation of the manhole cover shall be flush with the surrounding ground surface. The manhole sections shall be 48-inch interior diameter (ID) precast reinforced concrete manhole sections. The precast concrete manhole sections shall conform to ASTM C 478 and SECTION 03425 – PRECAST CONCRETE. The finish floor of the manholes shall be constructed of cast-in-place concrete conforming to SECTION 03300 - CAST-IN-PLACE CONCRETE as shown on the drawings. Manhole sections shall be complete with risers, tapered risers, adapter rings, precast concrete manhole covers and shall be designed and manufactured in accordance with ASTM C 478. The manhole cover opening frame and bronze survey marker shall be cast into each manhole cover at the time of manufacture. Manhole steps shall be embedded into the wall a minimum of 3.0 inches but shall not be extended on the outside of the structure. Manhole steps shall be cast into the reinforced concrete manhole wall at locations as shown on the drawings. Flexible watertight preformed butyl mastic joint sealants shall be used conforming to ASTM C 990. Prior to placing the butyl mastic joint sealants, the concrete joint surfaces shall be clean and dry. Double rings, coils, or ropes of butyl mastic joint sealants shall be applied to each concrete joint per the manufacturer's product instructions. The oversized pipe openings shall be cast into the manhole sections to allow for field adjustments.

2.1.2 Relief Well Manhole Frames and Hinged Lids. The relief well manhole frames and hinged lids shall be heavy duty, constructed of cast gray iron conforming to ASTM A 48, Class 35B, and shall have a minimum tensile strength of 35,000 pounds per square inch. The frames and hinged lids shall be designed for AASHTO H-20 loadings. The relief well manhole frames shall have clear square openings of 29 inches X 29 inches with hinged lids. The lids shall be constructed with stainless steel butt hinges and waterproof lift handles. The frames shall be embedded into the precast manhole covers in accordance with manufacturer's recommendations.

2.1.3 Collector Manholes. The collector manholes shall conform to the lines, grades, and dimensions as shown on the drawings. The top elevation of the manhole cover shall be flush with the surrounding ground surface. The manhole sections shall be 72-inch interior diameter (ID) precast reinforced concrete manhole sections. The precast concrete manhole sections shall conform to ASTM C 478 and SECTION 03425 – PRECAST CONCRETE. Collector manholes shall be complete with precast concrete manhole sections, floors, risers, tapered risers, adapter rings, precast concrete manhole covers and shall be designed and manufactured in accordance with ASTM C 478. Manhole steps shall be embedded into the wall a minimum of 3.0 inches but shall not be extended on the outside of the structure. Manhole steps shall be cast into the reinforced concrete manhole wall at locations as shown on the drawings. Flexible watertight preformed butyl mastic joint sealants shall be used conforming to ASTM C 990. Prior to placing the butyl mastic joint sealants, the concrete joint surfaces shall be clean and dry. Double rings,

coils or ropes of butyl mastic joint sealants shall be applied to each concrete joint per the manufacturer's product instructions. The oversized pipe openings shall be cast into the manhole sections to allow for field adjustments.

2.1.4 Collector Manhole Frames and Lids. The seepage collector system manhole frames and lids shall be heavy duty, constructed of cast gray iron conforming to ASTM A 48, Class 35B, and shall have a minimum tensile strength of 35,000 pounds per square inch. The frames and lids shall be designed for AASHTO H-20 loadings. The relief well manhole frames shall have clear round openings of 24 inches in diameter. The lids shall be solid heavy duty cast gray iron with at least one lifting notch. The frames shall be embedded into the precast manhole covers in accordance with manufacturer's recommendations.

2.1.5 Manhole Steps. The manhole steps shall be constructed of cast gray iron, copolymer polypropylene plastic coated ½-inch, grade 60 steel reinforcement step, or ductile iron castings. The step materials shall have a minimum tensile strength of 35,000 pounds per square inch. The gray iron castings shall conform to ASTM A 48, Class 35B. The ductile iron castings shall conform to ASTM A 536, Grade 80-56-06.

2.2 LATERAL AND COLLECTOR PIPES. Lateral and collector pipe shall be constructed with precast reinforced concrete pipe. The reinforced concrete pipe (RCP) shall be designed and manufactured in accordance with ASTM C 76 for Class IV, ACPA Type 4 Standard Installation, SECTION 03425 – PRECAST CONCRETE, AASHTO H-20 loading, and as shown on the drawings. All reinforced concrete pipe joints shall be tongue and groove type joints. The connections between the manholes and the reinforced concrete pipes shall be made with mortar-applied in the field. No mortar or joint sealant shall be applied to the pipe joints between adjoining pipe sections. The joints shall be wrapped with nonwoven geotextile and secured as specified SECTION 02240 - GEOTEXTILE AND SILT FILTER FENCING.

2.3 FLEXIBLE WATERTIGHT PREFORMED BUTYL MASTIC JOINT SEALANTS. The flexible watertight preformed butyl mastic joint sealants shall conform to ASTM C 990 or AASHTO M-198 Type B. The sealants shall consist of high quality butyl rubber with at least 98% solids to minimize hardening, shrinkage, and oxidation. The joint sealants shall be at least ½-inch, preformed coils or ropes and supplied in ready-to-apply forms. The preformed joint sealant coil or rope shall be applied so the ends meet and not overlapped.

2.4 MORTAR. Mortar shall be used for the joints connections between the manholes and pipes as shown on the drawings. The mortar shall conform to ASTM C 270, Type M, except the maximum placement time shall be 1 hour. The quantity of water in the mixture shall be sufficient to produce a stiff workable mortar. Water shall be clean and free of harmful acids, alkalizes, and organic impurities. The mortar shall be used within 30 minutes after the ingredients are mixed with water. The inside of the joint shall be wiped clean and finished smooth. The mortar head on the outside shall be protected from air and sun with a proper covering until satisfactorily cured.

2.5 BRONZE SURVEY MARKERS. Bronze survey markers shall be cast into the precast concrete relief well manhole covers. The bronze survey markers shall be made from silicon bronze bar, orbitally formed, and conforms to ASTM B 98. The survey marker shall have a 4-inch diameter domed cap, "C" style (U.S. Army Corps of Engineers Type 1 Disc) with a minimum 0.75-inch diameter, 3-inch long split-style tapered stem.

2.6 DRIVE POINT DRAINS. The drive point well screens shall be 2-inch outside diameter (OD), stainless steel continuous slot, wire-wound design. It shall be fabricated by circumferentially wrapping a triangularly shaped wire around a circular array of internal rods. The wire configuration shall produce inlet slots with sharp outer edges, widening inwardly to minimize clogging. Each juncture between the horizontal wire and the vertical rods shall be fusion welded under water by the electrical resistance method. End fittings shall be welded to the screen body. All pipes, rods, bars, wire, and fittings shall be stainless steel conforming to ASTM A 312, Grade Type 304. The width of the clear space between the wire wrappings shall be 0.010-inch. The 2-inch OD pipe extensions and couplings shall be stainless steel conforming to ASTM A 312, Grade Type 316 with NPT threads. The top of the pipe extension shall be fitted with a threaded coupling. Couplings shall be threaded on both ends with NPT threads. The drive point drains shall be constructed as shown on the drawings.

PART 3 - EXECUTION

3.1 PRECAST CONCRETE OPERATIONS. The Contractor shall construct the required precast concrete components to include but not be limited to the items specified in SECTION 02720 PART 2 – PRODUCTS, ASTM C 76, ASTM C 478, SECTION 03425 – PRECAST CONCRETE, and as shown on the drawings. One bronze survey marker, as specified in paragraph 02720-2.5, shall be embedded in each relief well manhole cover as shown on the drawings.

3.2 EXCAVATION AND FOUNDATION PREPARATION. The excavation and foundation preparation to construct the relief well manholes and collector system shall conform to the requirements specified in SECTION 02200-EARTHWORK. Shoring shall conform to the requirements specified in SECTION 02200 - EARTHWORK. The Contractor shall excavate and prepare the foundations to the lines, grades, and dimensions as shown on the drawings. The Contractor shall excavate at least 24 inches below the bottom of the collector manholes and collector pipes. The Contractor shall place and compact the coarse aggregate (CA 7) material backfill bedding wrapped in nonwoven geotextile under the collector manholes and collector pipes in accordance with SECTION 02200 - EARTHWORK and as shown in the drawings. The excavation for the relief well manholes shall conform to the lines, grades, and dimensions as shown on the drawings and as specified in SECTION 02200 - EARTHWORK.

3.3 PIPE AND MANHOLE PLACEMENT. All pipe and manhole components shall conform to the requirements specified in SECTION 02720 PART 2- PRODUCTS. Each collector manhole section, relief well manhole section, lateral pipe

section, collector pipe section, riser, cover, and all other components shall be carefully examined before being permanently placed and secured. Defective or damaged components and sections shall not be used. The collector pipes and lateral pipes shall be laid to the lines and grades as shown on the drawings. Proper facilities and equipment shall be provided for lowering sections of pipe into trenches. Lifting lugs in vertically elongated metal pipe shall be placed in the same vertical plane as the major axis of the pipe. Under no circumstances shall pipe be laid in water, and no pipe shall be laid when trench conditions or weather are unsuitable for such work. Dewatering and diversion of drainage during construction shall be provided as necessary. All pipe sections placed shall be inspected before the pipe joints are wrapped, and those pipes damaged during placement shall be removed and replaced. Laying the reinforced concrete pipe shall proceed downgrade with tongue ends of tongue-and-groove pipe pointing in the direction of the flow. Concrete pipe ends shall be protected to assure sand backfill does not enter pipe during backfill operations. All manhole and pipe joints shall be wrapped with nonwoven geotextile and secured as specified SECTION 02240 - GEOTEXTILE AND SILT FILTER FENCING. The Contractor shall secure the in-place pipe sections to maintain pipe alignment with a maximum tolerance of 1.0-inch from the designed pipe centerlines. The Contractor shall place and compact the backfills in accordance with the requirements specified in SECTION 02200 – EARTHWORK. When the collector pipe backfills are between 12 and 24 inches above the top of the collector pipes, the pipes shall be inspected to determine whether significant displacement has occurred. This inspection shall be conducted in the presence of the Contracting Officer. The pipe shall be inspected by shining a laser between manholes and the far end of the pipe. If, in the judgment of the Contracting Officer, the interior of the pipe shows poor alignment of more than 1.0-inch off centerline or any other defects that would cause improper functioning of the system, the defects shall be remedied as directed at no additional cost to the Government. The maximum tolerance for the placement of the relief well manholes and collector system shall be 1.0-inch plus or minus in any and all directions.

3.4 DRIVE POINT DRAINS. The drive point drains shall consist of drive point well screen and extensions as specified in paragraph 02720-2.6 and as shown on the drawings. The drive point well screen and extensions shall be driven and/or jetted below the bottom of the relief well manhole base and pad to the depths shown on the drawings. The drive point drains shall extend up though the relief well manhole base and pad and through the cast-in-place relief well manhole floor. The top of the drive point drain that is fitted with a top coupling shall be flush with the floor surface to allow manhole interior drainage through the drive point drain. The pipe treads in the top coupling to allow a pipe extension to be screwed into the coupling to be used as a piezometer.

3.5 JOINTS. The joints between the manhole sections shall be made with flexible watertight preformed butyl mastic joint sealants that conform to the requirements specified in paragraph 02720-2.3. Prior to placing the butyl mastic joint sealants, the concrete joint surfaces shall be clean and dry. Double rings, coils or ropes of butyl mastic joint sealants shall be applied to each concrete joint per the manufacturer's product instructions. Pipes connecting to the manholes shall be aligned through the preformed

openings and secured with mortar that conforms to or exceeds the requirements in paragraph 02720-2.4 and as shown on the drawings. To allow seepage flows into the collector pipes, the collector pipe joints between like pipes shall not have any sealants, gaskets, or mastic products applied to the collector pipe joints. Lateral pipes connecting to collector pipes shall be field connected and the pipe connections sealed with mortar. The collector pipe shall be aligned with the previously installed pipe, and the joint pushed home. Nonwoven geotextile shall be wrapped around the joints as specified in SECTION 02240 - GEOTEXTILE AND SILT FILTER FENCING.

3.6 REPAIR OF EXISTING (EX-1) MANHOLE. The Contractor shall excavate the area of subsidence adjacent to the existing EX-1 manhole and the existing 48-inch diameter corrugated metal pipe (CMP) in accordance with the requirements specified in SECTION 02200 – EARTHWORK. The Contractor shall thoroughly clean the concrete surfaces and exposed portions of the CMP for inspection. The Contractor and Contracting Officer will inspect the existing manhole and pipes for damages and/or deterioration of the structures. The Contractor shall apply a watertight butyl rubber sealant in trowelable form to all exposed joints, cracks and holes that may be allowing foundation materials to migrate into the manhole and thereby causing surface subsidence. The sealant shall be flexible watertight butyl rubber sealant conforming to ASTM C 990. The Contractor shall completely wrap the exposed portion of the CMP and existing manhole with nonwoven geotextile and secure it in place. The contractor shall backfill the 48-inch diameter CMP and existing manhole using random material. The random material shall be placed and compacted in accordance with the requirements for collector manholes and lateral pipes as specified in SECTION 02200 – EARTHWORK.

3.7 BACKFILLS. The backfills for the relief well manholes, collector manholes, lateral pipes, and collector pipes shall conform to the requirements specified in SECTION 02200 - EARTHWORK. The final backfill surface including the topsoil shall be flush with the surrounding ground surfaces.

3.8 FINAL DRESSING OF ALL DISTURBED AREAS. All disturbed areas shall be dressed smooth and rolled with a smooth drum roller for the establishment of turf by others.

-END OF SECTION-

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